PERSONNEL ISSUES, PERIPHERALS, TERMINALS

AND OFFICE PRODUCTS

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PERSONNEL SKILL MIX AND COMPENSATION REQUIREMENTS - OFFICE PRODUCT AND PERIPHERAL/TERMINAL VENDORS

DECEMBER 1983

PERSONNEL SKILL MIX AND COMPENSATION REQUIREMENTS –
OFFICE PRODUCT AND PERIPHERAL/TERMINAL VENDORS

ABSTRACT

This report introduces the changing role of the field engineer as it is affected by technological advances and by the field service organization's development from cost center to profit center.

Skill mixes and compensation requirements are presented as a reflection of this changed role of the field engineer.

Over 30 office product and peripheral/terminal vendors were interviewed concerning their present and future personnel administration practices and procedures.

This report contains 100 pages, including 40 exhibits.

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PERSONNEL SKILL MIX AND COMPENSATION REQUIREMENTS - OFFICE PRODUCT AND PERIPHERAL/TERMINAL VENDORS

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PERSONNEL SKILL MIX AND COMPENSATION REQUIREMENTS - OFFICE PRODUCT AND PERIPHERAL/TERMINAL VENDORS

EXHIBITS

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I INTRODUCTION

I   INTRODUCTION

- This report is produced by INPUT as a part of the 1983 Field Service Program for the United States, for clients of that program.

- As the use of computer equipment continues to rise, the need for maintenance of those computers will rise also. Consequently, the demand for both entry-level and qualified field service employees will continue to grow. Thus the recruitment and retention of employees will become a crucial issue for vendors.

- As more field service organizations become profit centers, vendors will be increasingly concerned with cost effectiveness. Vendors will also look at new personnel management activities as ways of reducing costs and improving service.

- For these reasons, INPUT has produced two detailed reports. One groups large-system vendors with small-system vendors, and the other combines peripheral/terminal vendors with office products vendors. There are common issues within each group.

- This report deals specifically with peripheral/terminal and office product vendors, although industry-wide trends and issues have been covered where applicable.

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A.   DEMOGRAPHICS

- A total of seven large-system vendors, twenty small-system vendors, twenty-one peripheral/terminal vendors, and eleven office product vendors were interviewed between July and September, 1983. Interviews were completed on-site, over the telephone, and by return mail. Exhibit I-I provides a list of vendors interviewed.

- Vendors were interviewed concerning their personnel management activities, both current and future. The basis of the vendor interview was the questionnaire shown in Appendix B. In addition, client comments and opinions were solicited.

B.   METHODOLOGY

- To prepare this report, survey results have been combined with extensive ongoing research at INPUT and in the industry. Additional incentive analysis has been added in Appendix A.

- The objective was to determine the trends in personnel skill mix, and total compensation and management, in light of the most recent developments in the field service marketplace. These developments include the absorption of software support into the hardware support organization, growth of support centers, remote diagnostics, and the trend towards off-site repair (e.g., swapping boards at the customer site and repairing them at a repair center).

- Field service is predominantly a people-based service and the individual skills, capabilities, and attitudes of each field engineer determine the efficiency, image, and role that the service organization can accomplish.

- This report seeks to outline the goals and trends of vendors active in the office products and peripheral/terminal marketplaces.

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EXHIBIT I-1
VENDORS INTERVIEWED

COMPANY NAME	LARGE SYSTEM	SMALL SYSTEM	PERIPHERAL/ TERMINAL	OFFICE PRODUCTS
3M				●
Ampex Corp.			●	
Anderson Jacobson, Inc.			●	●
Apple Computer, Inc.				●
Astrocom Corp.		●		
BTI Computer Systems		●		
Bell & Howell Co.			●	●
Braegen Corp.			●	
CPT Corp.				●
Calcomp		●	●	
Calma Co.		●		
Cambex Corp.	●			
Compugraphics Corp.		●		
Computer Automation, Inc.		●		
Consultants Field Engineering		●		
Control Data Corp.	●	●	●	
Cray Research, Inc.	●			
Diablo Systems, Inc.			●	
Digital Equipment Corp.	●	●	●	
Exxon Office Systems Co.				●
Floating Point Systems, Inc.	●			
Four-Phase Systems, Inc.		●		
General Electric Information Services Co.		●		

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Continued

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EXHIBIT I-1 (Cont.)

VENDORS INTERVIEWED

COMPANY NAME	LARGE SYSTEM	SMALL SYSTEM	PERIPHERAL/ TERMINAL	OFFICE PRODUCTS
General Datacom Services Corp.		●		
Harris Corp.		●		
ISC Systems Corp.			●	
ITT			●	●
Indeserve, Inc.		●	●	
Itek Graphic Systems, Inc.			●	
Memorex Corp.			●	
Mohawk Data Sciences Corp.			●	●
National Advanced Systems, Inc.	●	●	●	
Northern Telecom, Inc.			●	●
Perkin Elmer Corp.	●			
Q1 Corp.		●		
Rapicom, Inc.				●
Rolm Corp.				●
Scan-Data Corp.		●		
Siemens Corp.			●	
Stratus Computer Inc.		●		
Systems Integrators, Inc.			●	
TRT Data Products			●	
TRW			●	
Telex Computer Products, Inc.			●	
Texas Instruments, Inc.		●		
Triad Systems Corp.		●		
Totals	7	20	21	11

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II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. OVERVIEW

- A vital factor in the successful administration of personnel is the creation of both short-term and long-term plans outlining the profile of the work force. This profile should address the number of people needed in each job category, the skills necessary within each job category, and the individual worker characteristics needed for each job category.

- In field service personnel management the outlining of these profiles should then be matched with the overall profile of the company. In this fashion, the service needs, as affected by such changes as new product releases or discontinued-product announcements, can be effectively planned for, rather than treated on a contingency basis.

- By matching present and future product mixes with the present and future skill mixes, the field service organization can achieve two objectives:

  - Reduce the likelihood of either too few, or too many qualified engineers in relation to the functional skill mix needed in the field.

  - Reduce the likelihood of having staff with the wrong skills in relation to the product mix present in the field.

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B.   PERSONNEL MANAGEMENT CHALLENGES

- In order to assure that the field service organization can effectively maintain the equipment the vendor is responsible for servicing, the field service organization has to balance two profiles, the service requirements profile, and the personnel requirements profile.

- The service requirements profile consists of the vendor's product mix, both current and planned, and the skill mix necessary to maintain the equipment produced. Both these factors are influenced by time and volume, for example, the number of each type of product in the field, and the rate of increase of the base to be serviced in relation to the time needed to train the necessary staff. Once the field service managers have determined the above mixes, they can plan hiring and training programs that fit the personnel requirements profile.

- The personnel requirements profile is unique to each company and is made up of a composite list of characteristics, both tangible and intangible, that help define the characteristics needed in a successful field engineer. These characteristics include basic education, service skills, compensation requirements, career goals, and personality. The last item (personality) is the most difficult to assess and/or modify through training, but it is a key component in the makeup of tomorrow's field engineer, since he will be called upon to fulfill a function that involves an increasing amount of client relations.

C.   COMPENSATION

- An obviously important element in the personnel requirements profile is the compensation requirements of the field service employee. Exhibit II-1 pro-

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EXHIBIT II-1

1983 AVERAGE FIELD SERVICE SALARY BY PRODUCT TYPE
($ Thousands Per Year)

Legend:
- Large Systems
- Small Systems
- Peripheral/Terminals
- Office Products

Category	Large Systems	Small Systems	Peripheral/Terminals	Office Products
FE Trainee	18.8	12.4	16.0	14.8
Qualified FE	28.8	21.3	19.9	18.3
Senior FE	35.3	27.0	23.2	20.6
Software Support Engineer	32.1	26.0	24.2	25.0
Line Manager	35.1	32.0	32.8	30.0

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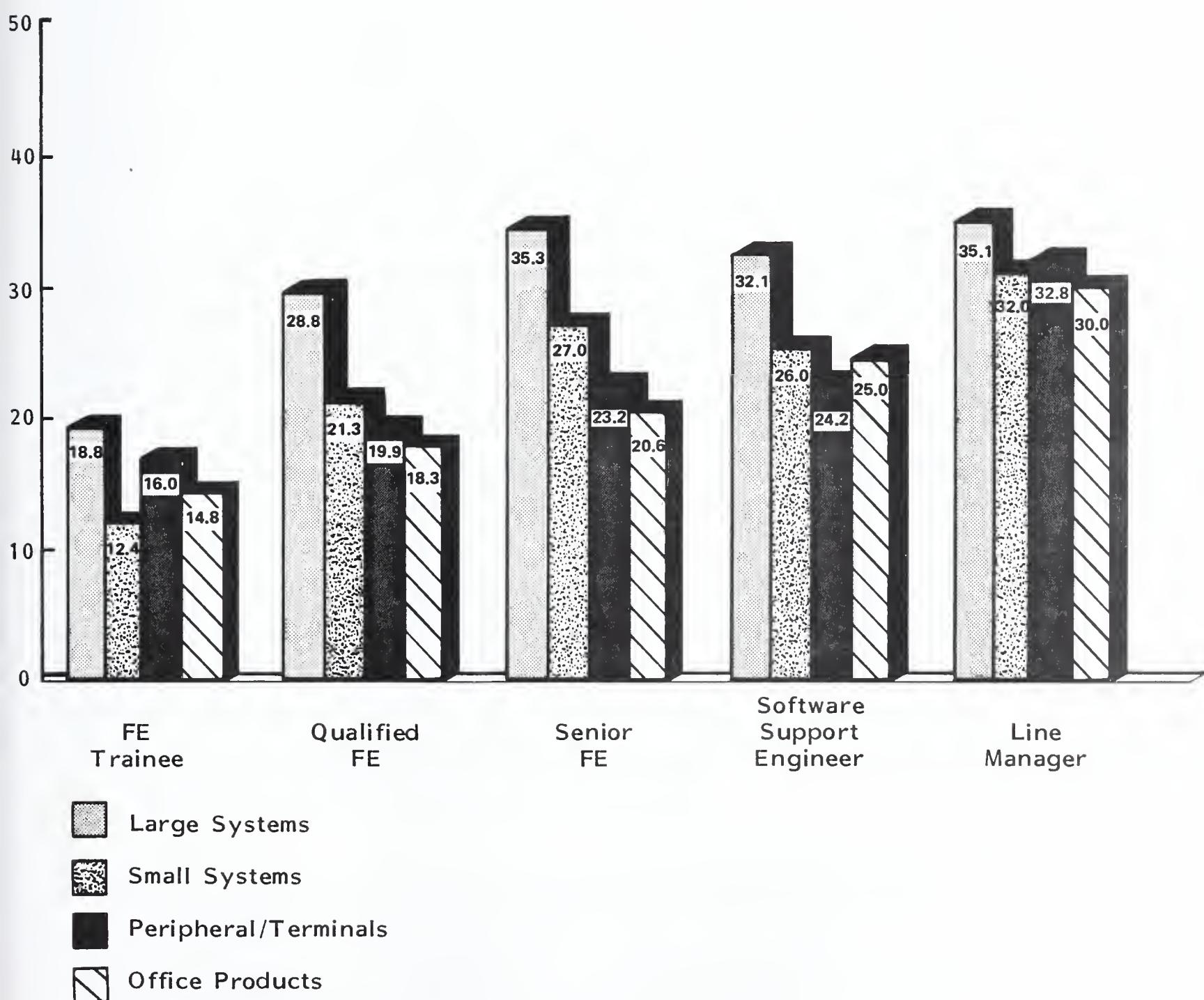
vides 1983 industry-wide salary averages for five field service positions: field engineer trainee, qualified field engineer, senior field engineer, software support engineer, and line manager.

- By and large, the highest salaries went to large-systems employees, as expected. All areas saw increases over 1982 in average salaries; however, the most important change occurred in salary ranges. The average 1983 salary ranges broadened at the lower ends for FE trainee, qualified field engineer, and software support engineer. This broadening reflects the trend towards reduced skills requirements that is in turn caused by an increased reliance on remote diagnostics, board swap repair, and user involvement in the repair process.

- Salaries make up only part of the field service employee's total compensation plan. Indirect compensation factors, such as health insurance and other benefits, stock and savings plans, holiday pay, and vacation pay, make up over one-third of an employee's base pay. Field service personnel administration should consider increasing benefits and other incentives in order to compete with the growing need for security that qualified field service personnel have.

- Improved benefit and incentive programs will especially aid small-systems vendors, who cannot compete in salary with large-systems vendors. Peripheral/terminal and office product vendors should benefit from offering incentives (such as performance bonuses and suggestion awards), which reward the worker for increased output and benefit the company via increased employee performance and morale.

D.   CHANGES IN STAFFING LEVELS

- The increased reliance on new maintenance offerings and techniques has also changed the staffing level requirements of large-system, small-system, peripheral/terminal, and office product vendors.

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- Peripheral/terminal, and, to a greater extent, office product vendors are demonstrating a greater need for field engineer staff, especially at the level of qualified field engineer and software support engineer. Peripheral/terminal and office product vendors can expect growth in these positions of over 9% between 1983 and 1984.

- At the same time, staffing levels for line managerial positions are expected to drop, as a reflection of the development and maturation of the office products market.

- Vendors continued to stress the importance of previously trained candidates, as indicated by their sources of new employees. The four top sources for peripheral/terminal and office product users were trade schools, two-year college programs, employee referrals, and competition. Vendors feel that these will also be the best sources in 1985.

- As the changing role of the field engineer causes changes in maintenance duties, turnover will become a key factor in field service staffing. As more vendors move toward component and board exchange service, some FEs will leave their companies because of boredom (a common reason for leaving). Other FEs will be attracted by the higher compensation levels of large-systems vendors. All vendors will need to watch staff turnover rates in order to maintain a stable workforce and reduce overall training costs.

E.   THE CHANGING ROLE OF FIELD SERVICE

- In the past the internal (company) image of field service was that of necessary expense - an activity that was a requirement of doing business in the computer equipment marketplace. (It is interesting to note that this is the attitude of many software product vendors today; these vendors do not view

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software maintenance as a profit center). At that time the external (user) view of the field engineer was equally narrow - the FE was viewed as a hardware problem fixer.

- Over the last five years the internal image of field service has changed dramatically to that of a major contributor to company revenue, profit, and growth. Simultaneously, with the inclusion of software maintenance in the responsibilities of the field service organization, the user has come to view the FE as the sole source of system support.

- The logical extension of this progression in the field service organization, both internally and externally, is the placement of total responsibility for post-sales support in the hands of field service. From the user standpoint this will mean a single source of support. (Support is currently divided into marketing support, e.g., training and documentation, sales support, and systems support.) From the vendor standpoint the logical extension is making the field service organization responsible for managing each installed account - developing the account as well as servicing it, as shown in Exhibit II-2.

- This will bring the user view of field service closer to the company view and will require total unbundling of the various services provided:

  - Environmental planning.

  - Training (on-going).

  - Documentation.

  - Systems consulting.

  - Software maintenance.

  - Hardware maintenance.

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EXHIBIT II-2

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CHANGING ROLE OF FIELD SERVICE

	EXTERNAL IMAGE	INTERNAL IMAGE
Yesterday	Hardware Problem Fixer	Necessary Expense
Today	System Support	Revenue/Profit Generator
Tomorrow	Total Service	Managing, Developing and Servicing Installed Base

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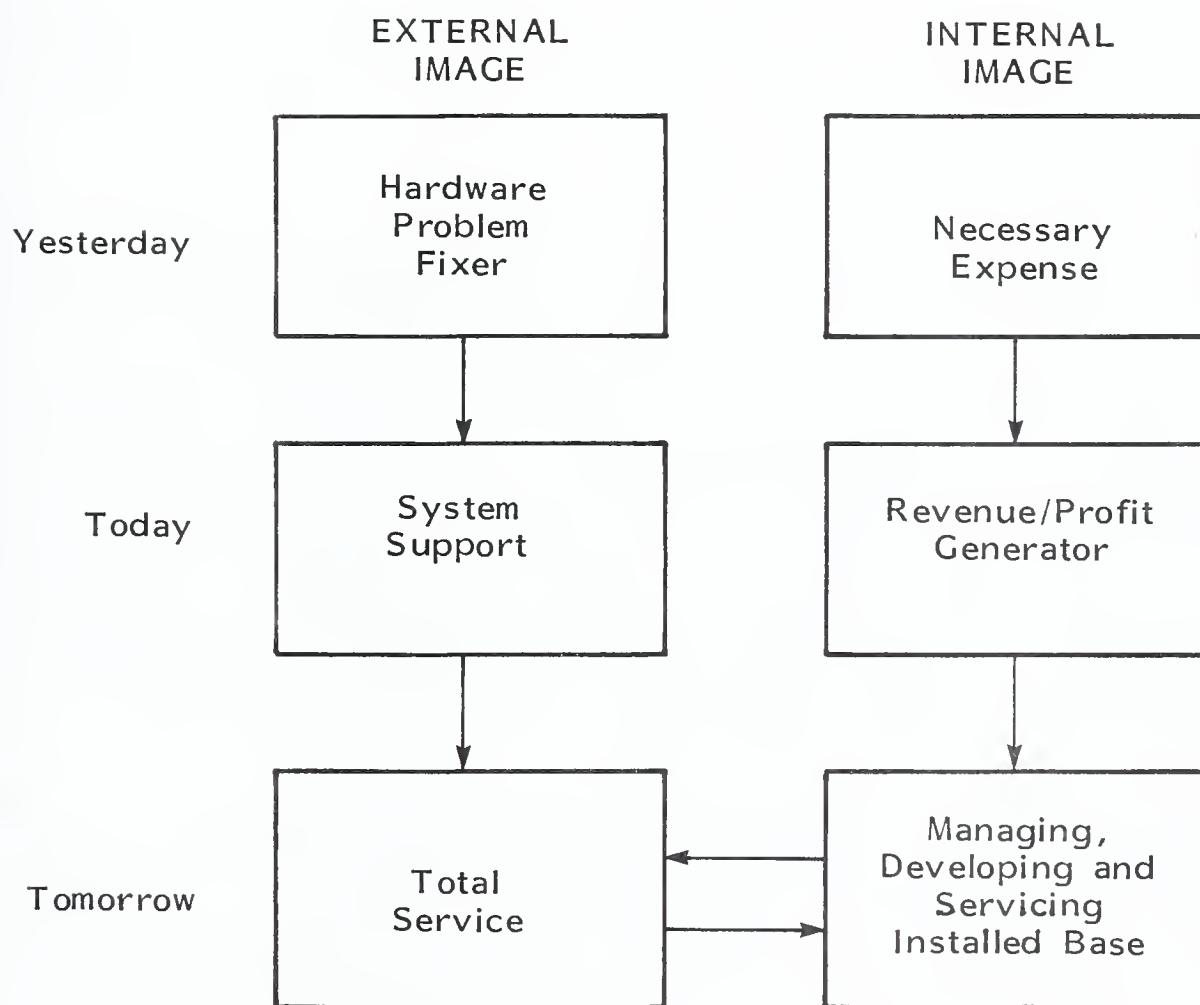
- Wherever field service manpower is used it should be tariffed and invoiced - including in-house time spent assisting sales in various capabilities (e.g., hardware/software configuration; installation planning). This accounting is necessary in order to bring to light the value of the hidden contributions that field services are currently making, contributions for which no revenue is accrued. Stricter accounting may also mean that some of the "free" services provided to customers (particularly consulting) will need to become chargeable items.

- The impact that the evolution in field service responsibilities has on the hardware engineer is shown in Exhibit II-3. In the past the field engineer was dispatched to a failed site before he had any indication of the nature of the failure. Diagnosis was done with whatever equipment was available on-site; diagnosis began at the systems level and worked down. The increased use of remote diagnostics now permits diagnostic analysis prior to dispatch so that on-site intervention concentrates on the failed subsystem that has been already identified. Future products are expected to be self-diagnosing to an even greater degree, so that diagnosis will be at the component level.

- Today's hardware engineer does less and less actual repair on-site. Failed boards are swapped, and the repair is left to the specialized repair centers. In the future, redundant or fail-soft hardware will enable the failed system to continue to function in at least a degraded mode so that the customer's continued use of the system will be minimally interfered with.

- Exhibit II-3 summarizes the salient points.

- In a similar fashion the software engineer's intervention has modified dramatically. In the past on-site visits were necessary for software failures of all kinds. Many of these so-called failures were the result of user misunderstandings or misuse of the product. This king of failure can be largely eliminated with the advent of the support center. In the future, the same remote

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EXHIBIT II-3

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CHANGING ROLE OF HARDWARE ENGINEERS

	PAST	PRESENT	FUTURE
Diagnostic	• On Arrival with Available Means • At System Level	• Prior to Arrival • At Subsystem Level	• Self-Diagnosing • At Component Level
Repair	• On-Site Repair of Failed Component	• Swap Failed Board, No Repair	• Redundant or Fail-Soft Hardware • Swap Failed Subsystem
System Status	• Down	• Down	• Up

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FPT3

connection that serves remote diagnostics from a hardware standpoint will also help the software support team with their diagnoses.

- Repair of a failure can then be effected by the down-line loading of either the patched or the revised code to the library version of the failed software package. This revised version can then be booted, the system restarted from the last checkpoint, and the customer's use of the system continued.

- In this manner, similar to the hardware failure resolution, tomorrow's user will get greatly improved response time on software failures; the vendor's costs for that same activity will be significantly reduced. This arrangement will also allow for a more stable schedule of revision issue because the pressure from the user base will be greatly diminished.

- Exhibit II-4 summarizes the main points.

F.   TRAINING, THE KEY TO SERVICE

- With all of these new roles to fulfill, the field service management of each company is faced with a series of important decisions:

    - What is the schedule of responsibilities that the field service organization is expected to accomplish over the next five years?

    - How does the current skill mix of that organization match the assigned responsibilities?

    - What is the schedule of training that is necessary to accomplish the revision of skills required by the plan?

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EXHIBIT II-4

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CHANGING ROLE OF SOFTWARE ENGINEERS

	PAST	PRESENT	FUTURE
Diagnostic	● On-site	● Support Center Assistance	● Remote Tie In
Repair	● On-site	● Revised Version Shipped	● Down-line Loading of Patched or Revised Code
System Status	● Down	● Down	● Degraded but Still Operable

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- Organizationally, a number of changes will have to be made that put in place a reporting structure that is compatible with the new responsibilities. In addition, some of the changes may require modification of commission plans (to compensate for the reassignment of some of the sales responsibilities), revenue plans, and profit center plans.

- It is unlikely that all of the changes discussed in this report will be able to be implemented in one step. Certainly much discussion will be needed between marketing and field services to resolve the points of contention that will arise. INPUT nevertheless believes that the time to plan such changes is now, because the training cycle is long for even the simplest of additional skills.

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III THE CHANGING ROLE OF THE FIELD ENGINEER

III THE CHANGING ROLE OF THE FIELD ENGINEER

A. INTRODUCTION

- As previously stated, the effective field service organization requires a balancing of the service requirements profile (which encompasses the planned product mix over a period of time and the skills mix necessary to support those products) and the personnel requirement profile (which reflects the characteristics of the individual field service engineer).

- As the product mix changes, the personnel skill mix also changes, causing a change in the individual characteristics needed by successful field engineers. Exhibit III-1 and Exhibit III-2 demonstrate how the changes in diagnostic capabilities of products have changed the role of both hardware engineers and software engineers.

- Changes in the economy also cause changes in the field service operations of a company, as vendors look for ways to reduce costs and develop new revenue sources. This reassessment has caused increased use of remote diagnostics and support centers. As the field service organization continues its trend toward profit center status, more changes can be expected.

- One such change suggested in previous INPUT reports (e.g., Large-Scale System User Requirements, August 1983) is the development of a total "after-sale support" philosophy by the field service organization. This philosophy entails an increased sales role by the field service engineer.

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EXHIBIT III-1

CHANGING ROLE OF HARDWARE ENGINEERS

	PAST	PRESENT	FUTURE
Diagnostic	• On Arrival with Available Means • At System Level	• Prior to Arrival • At Subsystem Level	• Self-Diagnosing • At Component Level
Repair	• On-site Repair of Failed Component	• Swap Failed Board; No Repair	• Redundant or Fail-Soft Hardware • Swap Failed Subsystem
System Status	• Down	• Down	• Up

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EXHIBIT III-2

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CHANGING ROLE OF SOFTWARE ENGINEERS

	PAST	PRESENT	FUTURE
Diagnostic	● On-site	● Support Center Assistance	● Remote Tie-In
Repair	● On-site	● Revised Version Shipped	● Down-line Loading of Patched or Revised Code
System Status	● Down	● Down	● Degraded But Still Operable

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B.   CHANGES IN THE SERVICE REQUIREMENTS PROFILE

- The service requirement profile analyzes the relationship between the present and future product mixes and the personnel skill mix required to support those products. The following technological advances have brought changes in the product mix, thus causing changes in the skill mix.

    - Increased quality of the product, which has resulted from improved manufacturing processes and specialization of function.

    - Improved reliability of the product.

    - Increased use of diagnostics, both remote and automatic.

    - Increased integration of function, which allows more opportunities to board swap.

    - Increased use of telecommunications, which allows increased use of remote diagnostics.

    - Increased use of redundant systems, which allow the use of backups in case of component failure.

- The above changes in the product mix have brought about changes in the overall skill mix necessary to maintain the present equipment. First of all, there is a reduced need for total-system knowledge, because board swap and component repair have brought the actual repair work down to the subsystem level. Second, the increased use of diagnostics, especially at the user site, requires an increased emphasis upon communication skills as opposed to strictly technical expertise.

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- As diagnostics become increasingly incorporated into product design, their effect on maintenance practices for peripherals, terminals, and, to a greater extent, office products will continue to rise. Exhibit III-3 shows the emphasis that office product vendors will place on both user self-diagnosis and remote diagnostics; peripheral and terminal vendors seem to prefer telephone field support. Since users are hesitant to accept these alternative delivery methods, as shown by Exhibits III-4 and III-5, vendors will need to improve communication between user and the vendor at both engineer and management levels.

- A final change in the product mix that influences the skill mix necessary in field service is the increased importance of software maintenance and the need to integrate software maintenance with hardware maintenance. Exhibit III-6 suggests that software maintenance integration will increase dramatically between 1983 and 1985, and that this increase will create a need for engineers that are trained in both hardware and software maintenance.

C. CHANGES IN THE PERSONNEL REQUIREMENTS PROFILE

- In order to successfully match candidates with positions in the field service organization, the company must match the applicant's individual characteristics with a set of composite characteristics felt necessary for success within the company. These requirements are both tangible (such as education, experience (or skill) level, compensation level) and intangible (such as attitude, internal image, career goals, and personality).

- In the past, a composite profile of a successful field engineer was as follows:

    - Well trained and educated at a system level.

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EXHIBIT III-3

VENDOR RATING OF IMPORTANCE OF
ALTERNATIVE METHODS OF FIELD SUPPORT

ALTERNATIVE METHOD	IMPORTANCE RATING	
	Peripheral/ Terminal	Office Product
On-site Field Support	8.8	6.6
Telephone Field Support	8.3	7.8
User Self-Diagnosis	6.1	9.2
Remote Diagnostics	5.6	8.4

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EXHIBIT III-4

PERIPHERAL/TERMINAL USER ATTITUDES TOWARD ALTERNATIVE DELIVERY METHODS FOR MAINTENANCE

MAINTENANCE DELIVERY METHOD	RATING*	
	HARDWARE	SOFTWARE
Traditional On-site Response to Trouble Calls	8.3	8.1
User Involvement in Diagnosis (Working with Support Center)	6.0	6.2
User Involvement in Replacing Circuit Boards, Other Components, or Patching Software	4.6	4.8
User Delivering Portable Modules to Repair Centers	3.4	3.6

* Rating: 1 = Low, 10 = High

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EXHIBIT III-5

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OFFICE PRODUCT USER ATTITUDES TOWARD
ALTERNATIVE DELIVERY METHODS FOR MAINTENANCE

MAINTENANCE DELIVERY METHOD	RATING*	
	HARDWARE	SOFTWARE
Traditional On-site Response to Trouble Calls	8.3	8.2
User Involvement in Diagnosis (Working with Support Center)	6.4	6.4
User Involvement in Replacing Circuit Boards, Other Components, or Patching Software	4.7	4.9
User Delivering Portable Modules to Repair Centers	4.0	4.2

* Rating: 1 = Low, 10 = High

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EXHIBIT III-6

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LEVEL OF INTEGRATION OF SOFTWARE SUPPORT WITH HARDWARE SUPPORT -
PERIPHERAL/TERMINAL AND
OFFICE PRODUCT VENDORS COMBINED

SOFTWARE SUPPORT ACTIVITY	VENDORS IMPLEMENTING	LEVEL OF INTEGRATION (percent)	
		1983	By 1985
Systems Software	83%	16%	40%
Applications Software	50	12	22
Third-party Software Maintenance	33	2	10

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- Very experienced at making repairs at a system level.

- Usually older, as a result of the first two characteristics.

- Had developed a more independent personality, because success was based upon a certain amount of individual responsibility to the client user site.

- Had a background that emphasized technical skills rather than interpersonal skills. This usually required a more introverted personality.

- Had higher pay requirements, as a result of greater experience, education, and skill levels.

- With recent changes in the product mix, the skill mix level has been consequently reduced, causing an overall reduction in the level of skills necessary in the personnel requirements profile. A more current profile of a successful field engineer includes:

  - Fewer skills necessary at the system level, as a result of automatic diagnosis, remote diagnostics, and component swap-out repair availability.

  - Less experience and education.

  - More interpersonal communication training.

  - Increased emphasis on "team players" versus individual performers.

  - Lower pay.

- A possible result of these changes is an increase in the turnover rate. In the past, field engineers were less likely to change jobs, because the amount of

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time and experience needed to perform repairs at the system level prohibited the possible job moves. Since less on-the-job experience will be necessary as the personnel skill mix changes, this prohibiting factor will be diminished. In addition, turnover will be affected by increased interaction of computer equipment, especially if vendors supply training for competitive products (see Chapter V).

- These changes in the profile of a field engineer will cause changes in other field service positions. For example, since individual field engineers will have a different level of skills on system-level repairs, field service managers will need more training on technical and interpersonal aspects. Managers will need to offer more aid in diagnosis and repair of equipment. As users become responsible for more self-maintenance, the field service manager will have to improve communications between himself and the user. In sum, improved communication skills will become more necessary to the field service organization.

- Exhibit III-7 presents peripheral/terminal and office-product users' ratings of the quality of communication between themselves and the field service organization.

D. THE ENGINEER'S ROLE IN AFTER-SALES SUPPORT

- In the previous INPUT report, Large-scale Systems User Requirements, INPUT introduced the total service concept, which combines traditional maintenance activity with post-sale services, such as consulting, training, add-on sales support, and supplies sales. In this manner after-sales support can become coordinated.

- Reasons for such a move include the already-established contact the field engineer maintains with the user, and the increased sense of trust the user

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EXHIBIT III-7

USER RATING OF FIELD SERVICE VENDOR COMMUNICATIONS

Peripheral/Terminal Vendors   Office Product Vendors

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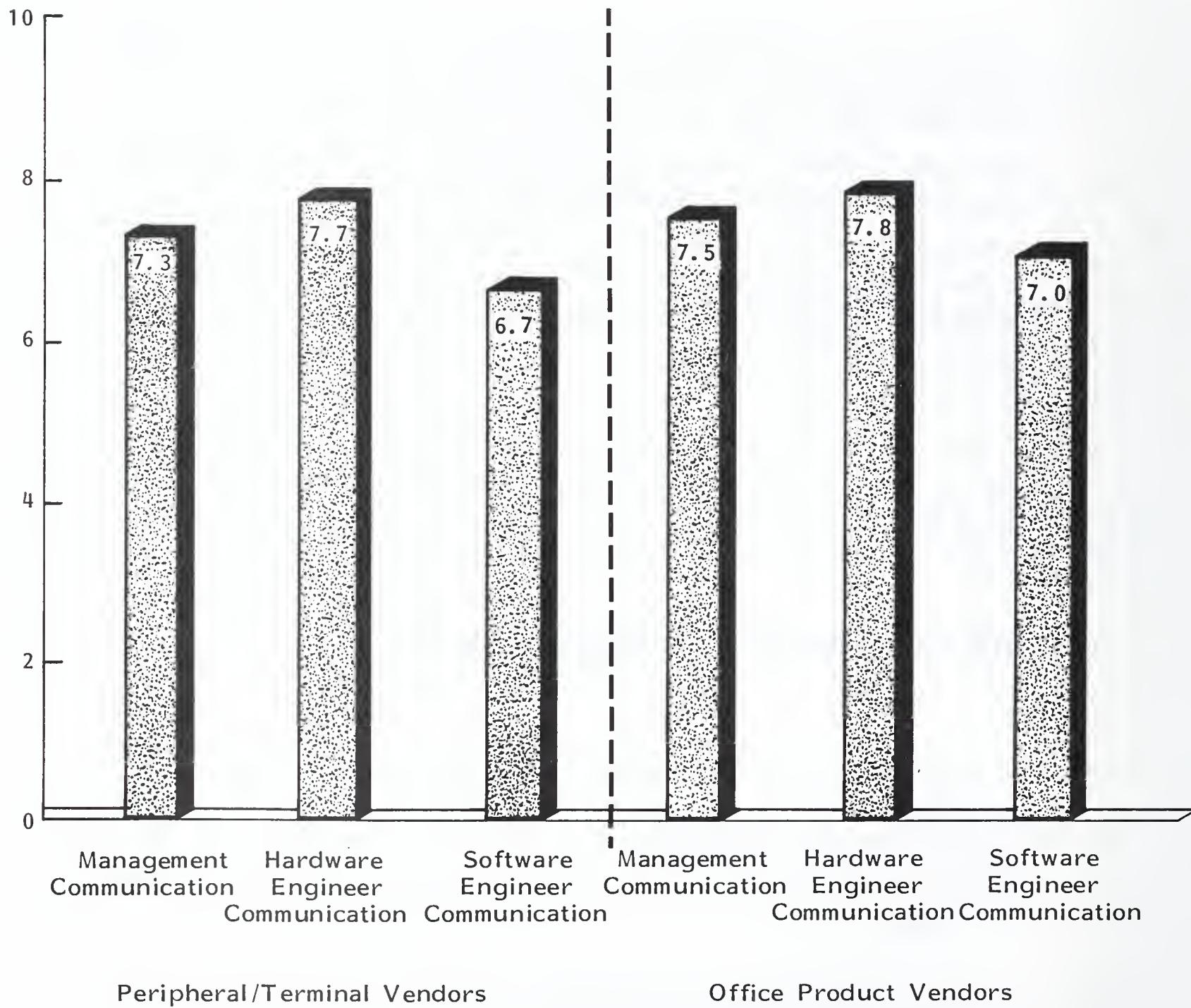
feels when the engineer is an impartial and unbiased source of advice and assistance.

- Users of peripherals, terminals, and office products did favor an increased FE role in the sale of hardware features, add-on equipment, upgrades, and new models of equipment, as indicated by Exhibits III-8 and III-9.

- Exhibit III-10 demonstrates that peripheral/terminal and office product vendors are recognizing that there is a need for greater coordination between sales and maintenance functions.

- The successful field service organization will increase the sales role of field service personnel. Improved communication with users and field service's increased sales role will result in better overall service and in greater opportunities for new revenue sources.

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EXHIBIT III-8

PERIPHERAL/TERMINAL USERS' ATTITUDES TOWARD
FIELD SERVICE ENGINEERS IN SALES ROLES
(percent)

FIELD SERVICE SALES ACTIVITY	FAVOR	OPPOSE	NEW
Supplies	28.7%	59.3%	12.0%
Hardware Features	57.0	35.0	8.0
Add-on Equipment	55.0	39.0	6.0
New Models of Equipment	53.0	38.0	9.0
Upgrades	62.0	30.0	8.0
Software Packages	32.3	55.7	12.0

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EXHIBIT III-9

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OFFICE PRODUCT USERS' ATTITUDES TOWARD
FIELD SERVICE ENGINEERS IN SALES ROLES
(percent)

FIELD SERVICE SALES ACTIVITY	FAVOR	OPPOSE	NEW
Supplies	33.6%	51.4%	15.5%
Hardware Features	53.9	37.9	8.2
Add-on Equipment	53.9	39.2	6.9
New Models of Equipment	49.3	43.2	7.5
Upgrades	57.2	35.6	7.2
Software Packages	39.5	35.0	25.5

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EXHIBIT III-10

SELECTED FIELD SERVICE EMPLOYEE ACTIVITIES
ENCOURAGED BY PERIPHERAL/TERMINAL AND
OFFICE PRODUCT VENDORS
(Combined)

ACTIVITY	VENDORS ENCOURAGING (percent)	
	1983	By 1985
Making Goodwill Calls	63%	86%
Accompanying Sales Personnel on Calls	50	86
Selling Maintenance Contracts	43	50
Attending Sales Meetings	25	57
Further Formal Education	25	29
Reading Trade Journals	13	14

INPUT
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IV COMPENSATION PROGRAMS

IV COMPENSATION PROGRAMS

A. OVERALL FIELD SERVICE PERSONNEL SALARY LEVELS

- In the past, salaries in field service have consistently grown despite the effects of the recession. In 1983, as shown by Exhibit IV-I, salaries continued to show growth; however, the increases for field engineer trainee and qualified field engineer were the smallest (5.0% and 5.1% respectively). These are considerably smaller increases than occurred in 1982, when trainee salaries increased 8.5% and qualified field engineer salaries increased 8.9%.

- Also, Exhibit IV-I shows that the salary ranges have broadened, especially at the lower ends, for all positions except line manager.

- This broadening can be explained by the trend toward reducing the experience, training, and skill levels for these lower skill positions. This trend should continue as more service is performed through remote diagnosis, user self-diagnostics, user self-maintenance, and board/component exchange/repair.

- The lower end of the software engineer's salary range dropped considerably from 1982 to 1983. This is a result of the growing demand for software engineers in the office products industry, which traditionally has paid lower salaries for field engineers.

INPUT

EXHIBIT IV-1

TRENDS IN FIELD SERVICE COMPENSATION - ALL PRODUCT TYPES

INPUT
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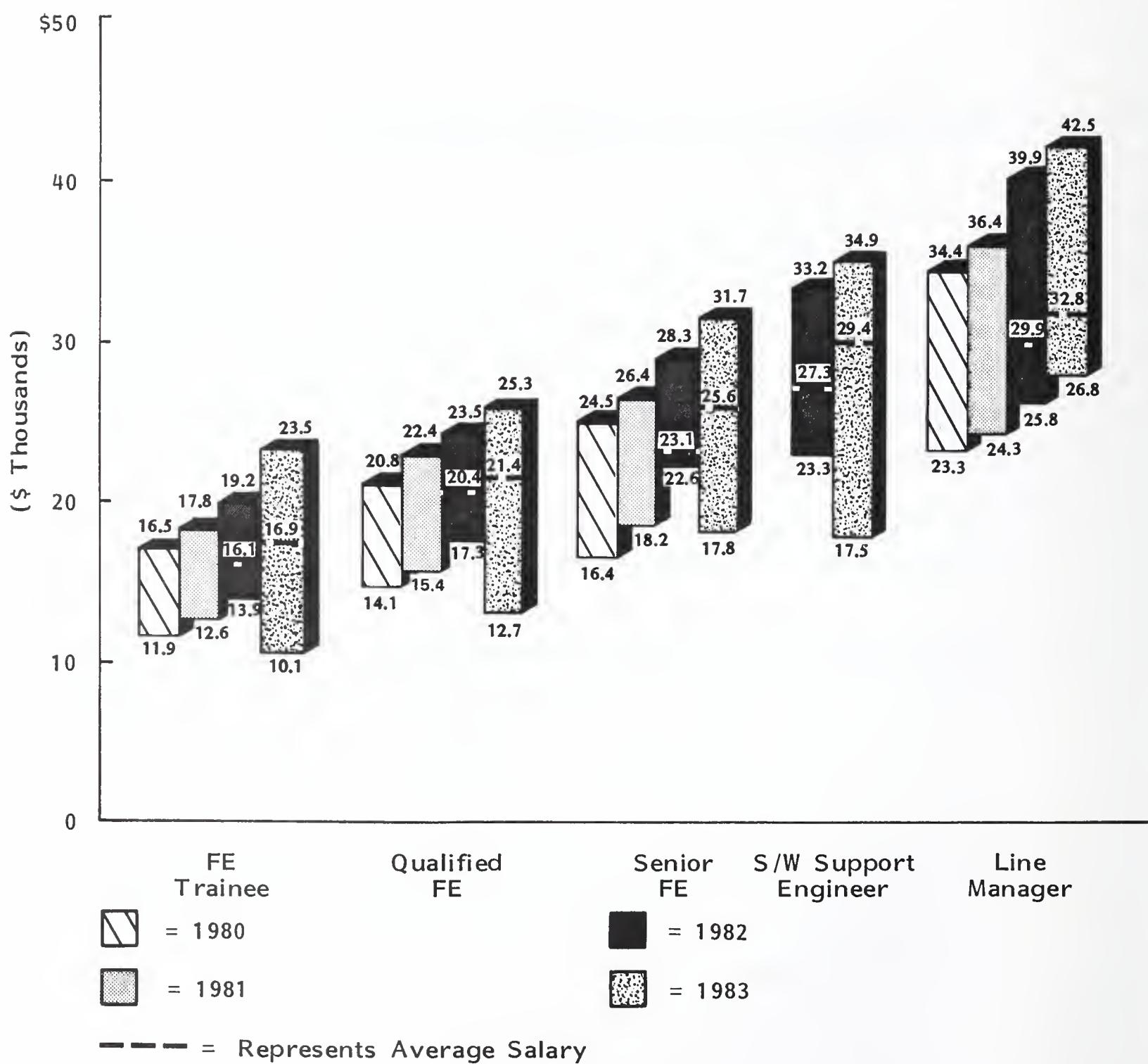
- Overall, senior field engineers and line managers continued in 1983 to benefit from the largest salary increases, just as they had in previous years. This trend should continue as the responsibility levels of senior FEs and line managers increase in order to compensate for the corresponding reduction of responsibility levels for the lower skill engineer positions.

B.   PERIPHERAL/TERMINAL AND OFFICE PRODUCT FIELD SERVICE SALARIES

- Exhibit IV-2 demonstrates peripheral/terminal average salary levels and how they changed from 1982 to 1983.

- Compared to overall field service personnel salary levels, the peripheral/terminal personnel experienced consistent growth from 1982 to 1983.

- Highest salary growth rates occurred in the lower skill positions – trainee and qualified FEs. This is the opposite of what occurred in the industry overall.

- The salary growth rates exhibited by office product personnel were higher than those of peripheral/terminal personnel, a result of the lower overall salaries in the office products industry. Exhibit IV-3 provides 1983 average annual salaries and salary increases from 1982 to 1983.

- Software engineer salaries in the office products industry, despite a high salary increase in 1983, are still too low. These salaries will be forced even higher as personal computer and word processing vendors integrate software and hardware support services.

- Line manager salaries should begin to level out as field service organizations in the office product industry continue to develop and mature.

INPUT

EXHIBIT IV-2

ANNUAL SALARY BY JOB TITLE –
PERIPHERAL/TERMINAL VENDORS

TYPE	AVERAGE 1983 SALARY	PERCENT GAIN OVER 1982
Trainee	$16,000	7.1%
Qualified Field Engineer	19,900	7.0
Senior Field Engineer	23,200	6.4
Software Support Engineer	24,200	6.4
Line Manager	32,800	6.6

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EXHIBIT IV-3

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ANNUAL SALARY BY JOB TITLE –
OFFICE PRODUCT VENDORS

TYPE	AVERAGE 1983 SALARY	PERCENT GAIN OVER 1982
Trainee	$14,800	9.7%
Qualified Field Engineer	18,300	9.0
Senior Field Engineer	20,600	9.0
Software Support Engineer	25,000	9.5
Line Manager	30,000	9.0

INPUT
FPT3

- Exhibit IV-4 compares peripheral/terminal and office product salary levels for 1983.

C.   BENEFITS

- It is important to treat benefits as part of the entire compensation package, because indirect compensation, such as savings plans, holiday pay, and vacation plans also can account for over one-third of an employee's base pay.

- Benefits can also be an effective means of attracting new employees.

- Another advantage of benefits is that, unlike direct salary increases, benefit improvements can be, and, in many cases, already are offered on a contributionary basis (i.e., employees and employers sharing the costs).

- Exhibit IV-5 demonstrates the importance of various benefits to the satisfaction level of employees.

- Commonly accepted benefits are life insurance, hospitalization, major medical, disability, and paid sick leave. It is also interesting to note the growing acceptance of appraisal and counseling programs, and of increased pay for meeting performance guidelines. Benefits like self-improvement programs and career path definitions show vendors' recognition of their employees' desire to grow, both as employees and as individuals.

- Benefits growing most in influence are optical coverage and matched savings programs. Optical coverage, along with increased dental coverage, will become more attractive as medical costs continue to rise. Matched savings can be an attractive way of inducing employees to stay with the company.

INPUT

EXHIBIT IV-4

PHERIPHERAL/TERMINAL AND OFFICE PRODUCTS – AVERAGE SALARIES AND RANGES – 1983

Chart: Salary ($ Thousands) on vertical axis, ranging from 0 to $50.

Position	Peripheral/Terminals (high / avg / low)	Office Products (high / avg / low)
Field Engineer Trainee	23.1 / 16.0 / 10.0	18.7 / 14.8 / 9.5
Qualified Field Engineer	26.1 / 19.9 / 13.1	25.4 / 18.3 / 11.9
Senior Field Engineer	28.1 / 23.2 / 14.5	29.5 / 20.6 / 13.9
Software Support Engineer	31.7 / 24.2 / 19.5	29.0 / 18.0 / 17.1
Line Manager	46.1 / 32.8 / 28.9	43.8 / 30.0 / 27.5

Legend:
- ⬛ = Peripheral/Terminals
- ▦ = Office Products
- – – – = Represents Average Salary

INPUT
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EXHIBIT IV-5

IMPACT OF FRINGE BENEFITS ON
SATISFACTION LEVEL OF EMPLOYEES

BENEFIT	PERCENT WHO FEEL THAT THE BENEFIT HAS A SIGNIFICANT IMPACT	
	1983	By 1985
Life Insurance	92%	91%
Hospitalization	100	100
Major Medical	100	100
Limited Medical	73	82
Dental	86	80
Eyesight/Glasses	36	42
Retirement	86	89
Disability Insurance	93	90
Matched Savings	43	64
Profit Sharing	29	20
Paid Sick Leave	93	90
Grievance Procedures	57	60
Improvement Programs	79	73
Appraisal and Counseling	93	90
Career Path Definitions	86	82
Pay for Performance Guidelines	93	90

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FPT3

- Exit interviews are seen as not important to an employee's overall satisfaction; they are important only as a benefit to the employer.

D.   INCENTIVES

- Incentives for improving employee performance have long been used by field service organizations. Direct salary increases usually come into effect too slowly to provide much motivation for improved employee performance. Performance incentives, on the other hand, are more direct and more satisfying to the employee.

- Obviously, incentives will only be effective if the employee wants them. Also, some incentives will be more effective with certain workers than they will be with others. It must be determined which incentives will evoke the best performance for the largest number of employees in each particular group.

- In Exhibits IV-6 through IV-8, incentives offered to peripheral/terminal and office product field service employees have been broken down into three employee groups - management, nonexempt, and exempt.

- Incentives most commonly provided in 1983 by peripheral/terminal and office product vendors to management employees were performance bonuses (73% of the vendors), stock options (64% of the vendors), and periodic recognition awards (also 64% of the vendors).

- Peripheral/terminal and office product vendors see management award conferences and trips as an incentive that will grow in importance by 1985.

- Stock options are used as an incentive predominantly to management-level personnel, but their use is increasing for all employees.

INPUT

EXHIBIT IV-6

INCENTIVES OFFERED TO FIELD SERVICE MANAGEMENT EMPLOYEES: PERIPHERAL/TERMINAL AND OFFICE SYSTEM VENDORS (COMBINED)

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	64%	63%
Performance Bonuses	73	63
Suggestion Awards	36	38
Periodic Recognition Awards	64	63
Special Projects, Foreign Assignments, etc.	41	38
Award Conferences, Trips	55	63
Competitive Scholarships for Employees or Family	23	25

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EXHIBIT IV-7

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INCENTIVES OFFERED TO FIELD SERVICE NONEXEMPT EMPLOYEES:
PERIPHERAL/TERMINAL AND OFFICE SYSTEM VENDORS (COMBINED)

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	36%	47%
Performance Bonuses	41	47
Suggestion Awards	50	53
Periodic Recognition Awards	59	67
Special Projects, Foreign Assignments, etc.	41	40
Award Conferences, Trips	41	47
Competitive Scholarships for Employees or Family	27	27

INPUT
FPT3

EXHIBIT IV-8

INCENTIVES OFFERED TO FIELD SERVICE EXEMPT EMPLOYEES:
PERIPHERAL/TERMINAL AND OFFICE SYSTEM VENDORS (COMBINED)

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	41%	47%
Performance Bonuses	45	47
Suggestion Awards	55	60
Periodic Recognition Awards	59	67
Special Projects, Foreign Assignments, etc.	41	40
Award Conferences, Trips	45	47
Competitive Scholarships for Employees or Family	27	27

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- Nonexempt employees most often received periodic recognition awards (from 59% of the vendors) in 1983. Sixty-seven percent of the vendors report that by 1985 they will offer periodic recognition awards to nonexempt employees.

- Exempt employees receive periodic recognition awards (also from 59% of the vendors) and suggestion awards (from 55% of the vendors). These awards are the ones most often given by peripheral/terminal and office product vendors. The most frequently reported recognition award is "Field Engineer of the Month."

- The incentive least likely to be offered to any employee group is competitive scholarships for employees or family. Employee education incentives are usually handled by tuition reimbursement, as shown in Exhibit IV-9.

E.   REIMBURSEMENT PRACTICES

- Reimbursement practices are another aspect of the total compensation package that is gaining importance to employees.

- These inducements, like other benefits, can be more cost-effective to employers than direct salary increases because the total cost of the practice can be shared by the employees.

- Relocation and tuition (for both education and training) are the expenses most commonly reimbursed in full. All vendors interviewed offered these programs: 85% fully reimbursed relocation expenses while 75% fully reimbursed tuition.

- It is interesting to note that the most commonly offered rewards (tuition reimbursement and relocation reimbursement) are also the rewards that contribute most to an employee's mobility. Thus employers contribute to their own turnover rate.

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INPUT

EXHIBIT IV-9

REIMBURSEMENT PRACTICES

CATEGORY	PERCENT FULLY REIMBURSED	PERCENT PARTIALLY REIMBURSED	PERCENT NOT REIMBURSED
Tuition Reimbursement/Training	75%	25%	0%
Relocation/Moving Expenses	85	15	0
Company Products	28	50	22
Professional Associations Memberships/Journals	53	21	26

INPUT
FPT3

V TRAINING AND EDUCATION

V   TRAINING AND EDUCATION

A.   INTRODUCTION

- The need for training improvements has been influenced by a number of factors:

    - A dramatic increase in the use of computer equipment, especially in the office products market.

    - A dramatic increase in the number of computer vendors, which in turn creates an increased demand for qualified field engineers.

    - Increased user awareness of the importance of field service maintenance.

    - Greater geographic distribution of users and equipment.

- These factors will contribute to the increased demand for trained field service employees, as demonstrated by Exhibit V-1. INPUT estimates that the overall demand for additional field service technicians will be 4,500-5,000 annually from 1982 to 1987.

- As the profile of the trained FEs required by each company becomes more specific, vendors will have to expand and improve both in-house and external training practices.

INPUT

EXHIBIT V-1

GROWTH IN EMPLOYMENT OF COMPUTER SERVICES TECHNICIANS
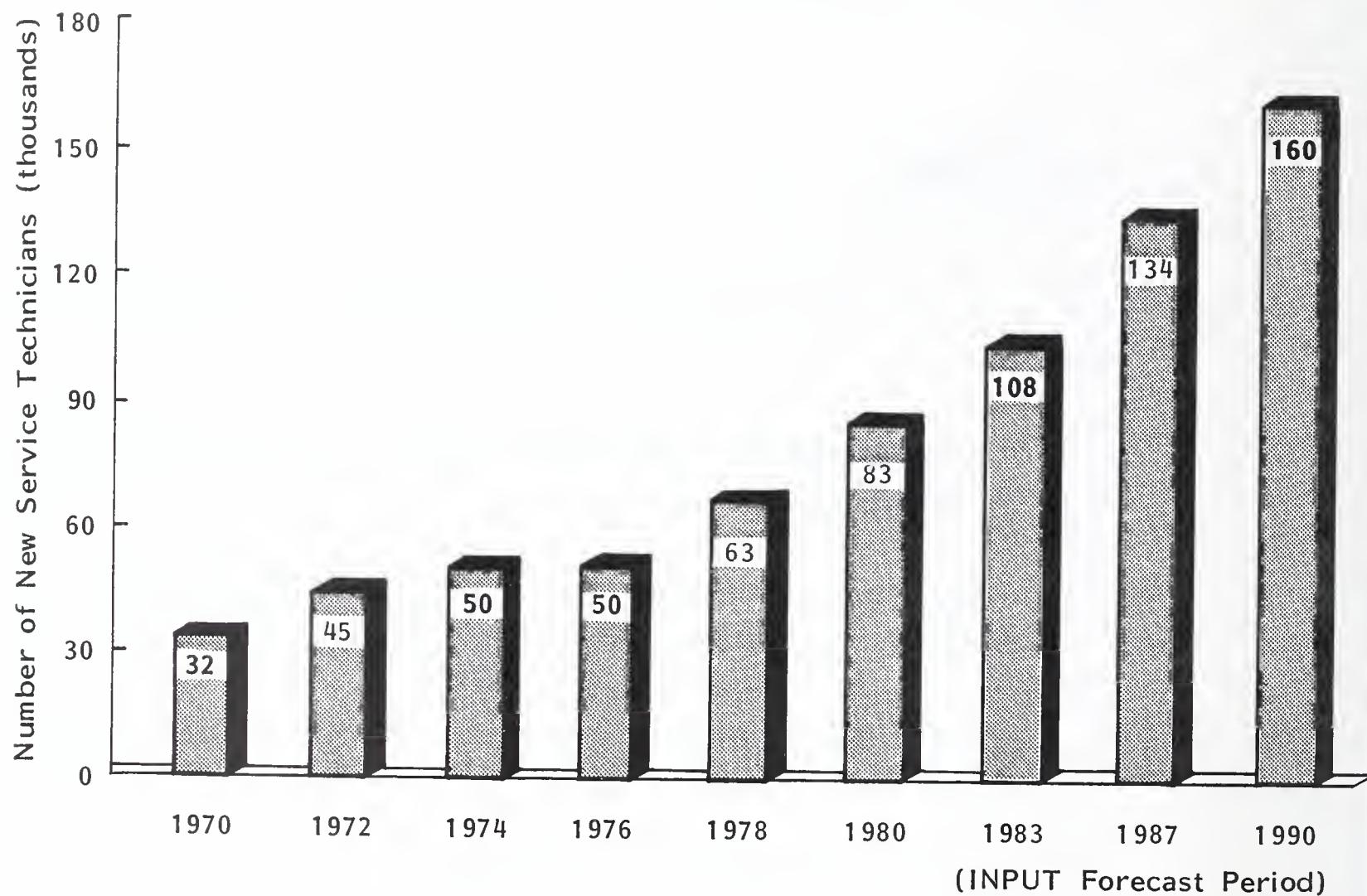
SOURCE: United States Bureau of Labor Statistics

INPUT

B.   IN-HOUSE TRAINING

- All the peripheral/terminal and office product vendors interviewed employed some type of in-house field service training program, both for new hires and for continuing employees. A large number of vendors reported increases in training and education expenditures over the next five years.

- Exhibit V-2 provides a list of in-house training programs offered by peripheral/terminal vendors. As can be expected, the greatest efforts are expended in technical-level product training and technological upgrading.

- Exhibit V-3 provides the same list for office product vendors. Again, the major emphasis is on technical training, both at the product level and at the technological-upgrade level.

- Vendors of both product types emphasize management development programs. These programs provide not only a new supply of managerial talent, but also an incentive for improved performance at the lower levels.

- Office products vendors, as can be expected, provide more emphasis on software training, both for systems and applications software. In the past, software support was handled by divisions other than field service, usually the software development division. The amount of software training in the field service organization can be expected to rise as more vendors increase the integration of software and hardware maintenance. (Details are shown in Exhibit III-6).

- The comparatively low amounts of basic training indicate that most vendors desire to hire trained FEs rather than train them in-house.

INPUT

EXHIBIT V-2

LEVEL AT WHICH COMPANY PROVIDES FORMAL TRAINING – PERIPHERAL/TERMINAL VENDORS

TRAINING AREA	PERCENT
Orientation	66.7%
Basic Training (Apprentice Level)	66.7
Product Training (Technical Level)	100.0
Systems Software	64.2
Applications Software	57.1
Management Development	73.3
Technological Upgrading	93.3

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EXHIBIT V-3

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LEVEL AT WHICH COMPANY PROVIDES FORMAL TRAINING - OFFICE PRODUCT VENDORS

TRAINING AREA	PERCENT
Orientation	71.4%
Basic Training (Apprentice Level)	42.9
Product Training (Technical Level)	100.0
Systems Software	85.7
Applications Software	71.4
Management Development	85.7
Technological Upgrading	85.7

INPUT
FPT3

- The relatively high percentage of orientation training indicates the importance that vendors place on creating a strong external and internal company image with the employee.

- An important issue, spurred by the increased use of office products within local area networks, is the maintenance of competitive products. Exhibit V-4 indicates that 73% of the vendors are already maintaining other vendors' equipment, while 60% plan to offer third-party repair centers by 1985. This will require vendors to provide in-house or external training on competitors' products. Two additional problems must be faced by vendors:

    - Vendors will need to find qualified instruction on competitors' equipment.

    - Field engineers, once trained on competitive products, will have more opportunities to leave. First, because they are more qualified in general, and second, because they are more attractive to the particular competitor for whose products they are now trained.

C. EXTERNAL TRAINING AND EDUCATION

- In the past, the only sources of training and education on computer maintenance were the vendors themselves. As the rise in computer usage demanded more engineers to repair the existing and future computer equipment, vendors found that they were not prepared to provide education and training quickly enough.

- Also, newer and smaller companies found that training and education costs prohibited them from developing trained field engineers in time to support their own equipment. It has been estimated that internal training costs between $1,000 and $2,000 per training day, including salaries, training program production costs, etc.

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EXHIBIT V-4

- 53 -

PERIPHERAL/TERMINAL AND OFFICE PRODUCT
VENDORS OFFERING THIRD-PARTY MAINTENANCE

SERVICE	IMPLEMENTATION (percent)	
	1983	By 1985
Third-party On-site Maintenance	73%	70%
Third-party Repair Centers	45	60

INPUT
FPT3

- Sources of external training and education have traditionally been two-year colleges, military schools, and trade schools. Two-year colleges, in particular, provide inexpensive and detailed instruction on computer maintenance, both at the basic and product-training levels. Exhibit V-5 demonstrates the rise in associate degrees in computer maintenance awarded between 1976 and 1981. The limited number of qualified instructors limits the number of courses offered, causing vendors to look for additional sources of training.

- More and more, vendors are looking toward training companies as a source of training and education for their field engineers. The advantages of these companies' programs are:

    - A detailed curriculum covering many different types of equipment, thus providing vendors with access to training on many competitive products.

    - Courses that are organized to make best use of vendors' time and resources.

    - A choice of different training techniques, including workbook format, lecture format, self-administered cassette format, or computer-assisted training format, all available on an "off-the-shelf" basis, or on a more detailed (and more expensive) custom-designed basis.

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INPUT

EXHIBIT V-5

- 55 -

NUMBER OF ASSOCIATE DEGREES AWARDED IN DATA
PROCESSING EQUIPMENT MAINTENANCE

YEAR
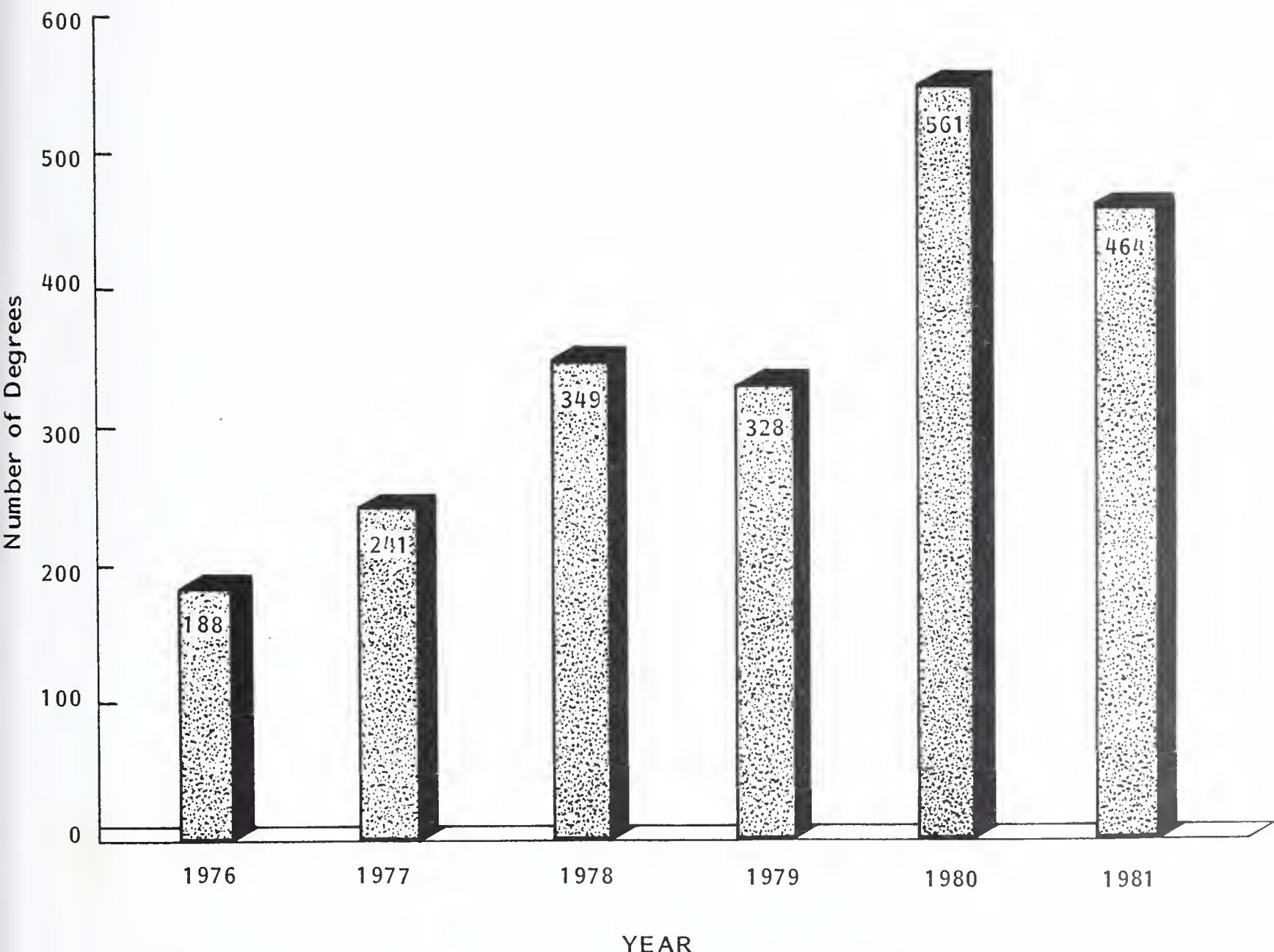
SOURCE: National Center for Educational Statistics

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VI   FIELD SERVICE STAFFING ISSUES

A.   STAFFING LEVELS

- Exhibit VI-I presents staffing level increases that peripheral/terminal and office product vendors experienced between 1982 and 1983. The exhibit also shows INPUT estimates for 1984 staffing levels for peripheral/terminal and office product vendors.

- From 1983 to 1984, total field service staffing growth for peripheral/terminal and office product vendors will slow (from 8.7% to 8.4%). This slowing is attributable to a dramatic drop in the growth of the average number of line managers (only 7.7% from 1983 to 1984, as compared to 19.9% from 1982 to 1983). The high growth rate exhibited from 1982 to 1983 can be traced to the extremely fast growth of the office product (more specifically personal computer, workstation, and word processor) industry, which required a large number of managerial people in order to start up . The 1983-to-1984 growth rate reflects the developing maturity of these companies.

- Peripheral/terminal and office product vendors began to expand the numbers of lower field service positions of field and support engineers in 1983-1984, reflecting the move towards modularization and board swap repair. This is especially true with the 11.7% increase in support engineers.

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INPUT

EXHIBIT VI-1

PERIPHERAL/TERMINAL AND OFFICE PRODUCT VENDOR
STAFFING LEVELS BY FUNCTION 1982-1984

CATEGORY	AVERAGE NUMBER OF EMPLOYEES			1982-1983 PERCENT CHANGE	1983-1984 PERCENT CHANGE
	1982	1983	1984*		
Total Field Service	730	794	860	8.7%	8.4%
Field Engineers	443	472	515	6.5	9.3
Support Engineers	37	38	42	2.7	11.7
Line Managers	29	35	38	19.9	7.7
Field Service Administration	104	141	150	4.7	6.2
Other	117	108	115	(7.7)	6.5

INPUT
FPT3

- The fact that field service administration staffing levels increased at a slower rate than the overall growth rate of the peripheral/terminal and office product industry demonstrates the increased vendor movement toward profit and loss control.

- Exhibit VI-2 shows general staffing increase levels for peripheral/terminal and office product vendors for the years 1983 and 1984.

B.   SOURCES OF NEW EMPLOYEES

- As staffing levels for peripheral/terminal and, to a greater extent, office product vendors continue to grow, vendors will need to seek out new sources of employees.

- The importance of hiring already trained employees for peripheral/terminal and office product vendors is very evident as compared to larger-system vendors. Smaller companies have neither the time nor the money to train field service employees in-house.

- Exhibit VI-3 stresses the importance of previously trained new hires. Trade schools and two-year college programs are rated by vendors as their most important sources of new employees, both now and by 1985. The fact that almost all sources will grow in importance by 1985 indicates that vendors will continue to look for qualified field service employees, especially from employee referrals and competition.

- Peripheral/terminal vendors report minor importance given to apprenticeship programs, four-year colleges, and other divisions within the company as sources of new employees, reflecting that vendors prefer not to provide extensive training.

INPUT

EXHIBIT VI-2

STAFFING LEVEL INCREASE: PERIPHERAL/TERMINAL
AND OFFICE PRODUCT VENDORS (COMBINED)

= 1982 to 1983

= 1983 to 1984 (INPUT Estimate)

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EXHIBIT VI-3

- 61 -
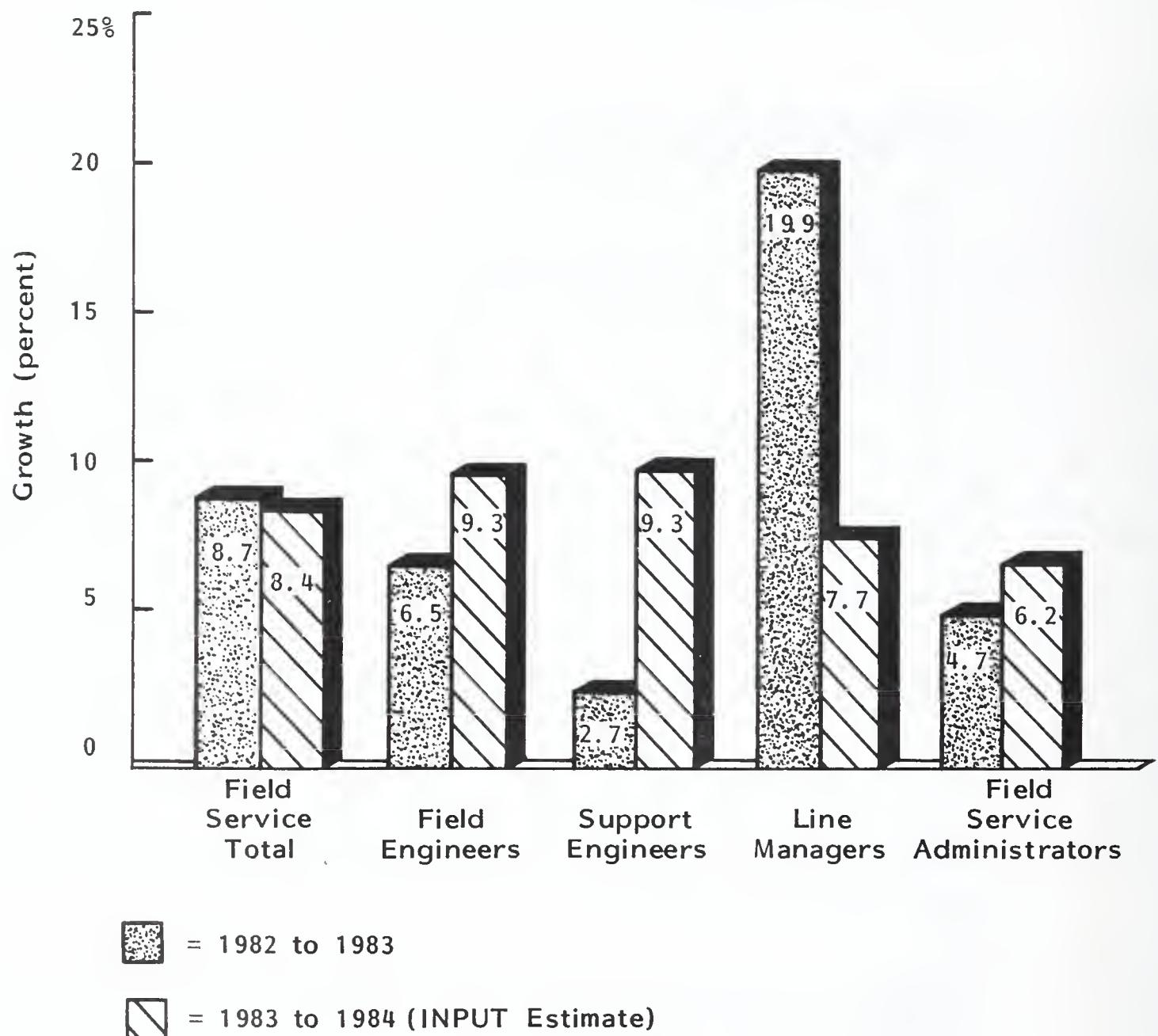
SOURCES OF NEW EMPLOYEES – PERIPHERAL/TERMINAL VENDORS BY IMPORTANCE

SOURCE OF NEW EMPLOYEES	1983 RATING*	1985 RATING
Trade Schools	7.2	7.2
Two-year College Programs	6.0	6.3
Employee Referrals	5.6	6.3
Competition	5.3	5.8
Military Schools	5.1	5.1
Other Divisions in Company	3.5	3.2
Four-year Colleges	3.3	4.3
Apprenticeship Programs	2.6	2.8
Other	3.5	3.9

* Rating: 1 = Low, 10 = High

INPUT
FPT3

- Office product vendors also look for trained field service employees, but not to the extent that peripheral/terminal vendors do. Exhibit VI-4 demonstrates office product vendors' reliance on employee referrals, long a popular and effective source of new employees, and competition, especially for the more skilled and managerial positions. Office product vendors see the importance of competition declining, however, and will move toward more traditional sources of trained employees, such as trade schools and military schools, by 1985.

- Office products vendors, like peripheral/terminal vendors, see apprenticeship programs and other divisions within the company as comparatively unimportant sources of new employees.

C.   TURNOVER

- Turnover will become a crucial issue for peripheral/terminal and office product vendors in the next few years. Factors affecting the turnover rate include:

    - Increased modularization of equipment, which will lead to increased use of board swap repair and ultimately to field engineer boredom.

    - Greater emphasis on communication skills and less on technical expertise.

    - More lucrative compensation plans offered by manufacturers of larger systems. These compensation plans will become even more crucial as large-systems manufacturers continue to enter the office products market.

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EXHIBIT VI-4

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SOURCES OF NEW EMPLOYEES — OFFICE PRODUCT VENDORS BY IMPORTANCE

SOURCE OF NEW EMPLOYEES	1983 RATING*	1985 RATING
Employee Referrals	6.8	7.6
Competition	6.3	4.8
Two-year College Program	6.0	4.8
Four-year Colleges	5.8	4.8
Trade Schools	4.8	5.2
Military Schools	3.5	4.5
Other Divisions in Company	3.3	3.3
Apprenticeship Programs	1.8	2.8
Other	0.0	0.0

* Rating: 1 = Low, 10 = High

INPUT
FPT3

- Exhibit VI-5 demonstrates the importance of better compensation as a reason for employees leaving peripheral/terminal and office product vendors. Better compensation is given as the reason for leaving 32% of the time. (The comparable figure is only 17% for large-systems vendors.) When the 32% figure is added to the percentage of employees who left for promotions with other companies (21%), over one-half of the employees left peripheral/terminal and office product vendors to work for competitors, emphasizing the importance of competitors as a source of new employees.

- The trend toward board swap and component exchange repair will increase turnover, not only by increasing FE boredom, a common reason for leaving (included in the "voluntary, no reason given" category), but also by increasing the use of maintenance skills that will be easily adaptable to competitors' products. As mentioned before, the amount of time necessary to become proficient with system-level repair formerly prohibited job changes. This inhibition will diminish.

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EXHIBIT VI-5

MAJOR REASONS FOR LEAVING FIELD SERVICE DEPARTMENT / COMPANY – PERIPHERAL/TERMINAL AND OFFICE PRODUCT VENDORS

Left for higher
salary, better
total compensation

31.6%

Promotion in
another company

21.1%

Relocation by
another company
5.3%

Other

10.4%

Released for
company reasons

15.8%

Voluntary,
no reason given

15.8%

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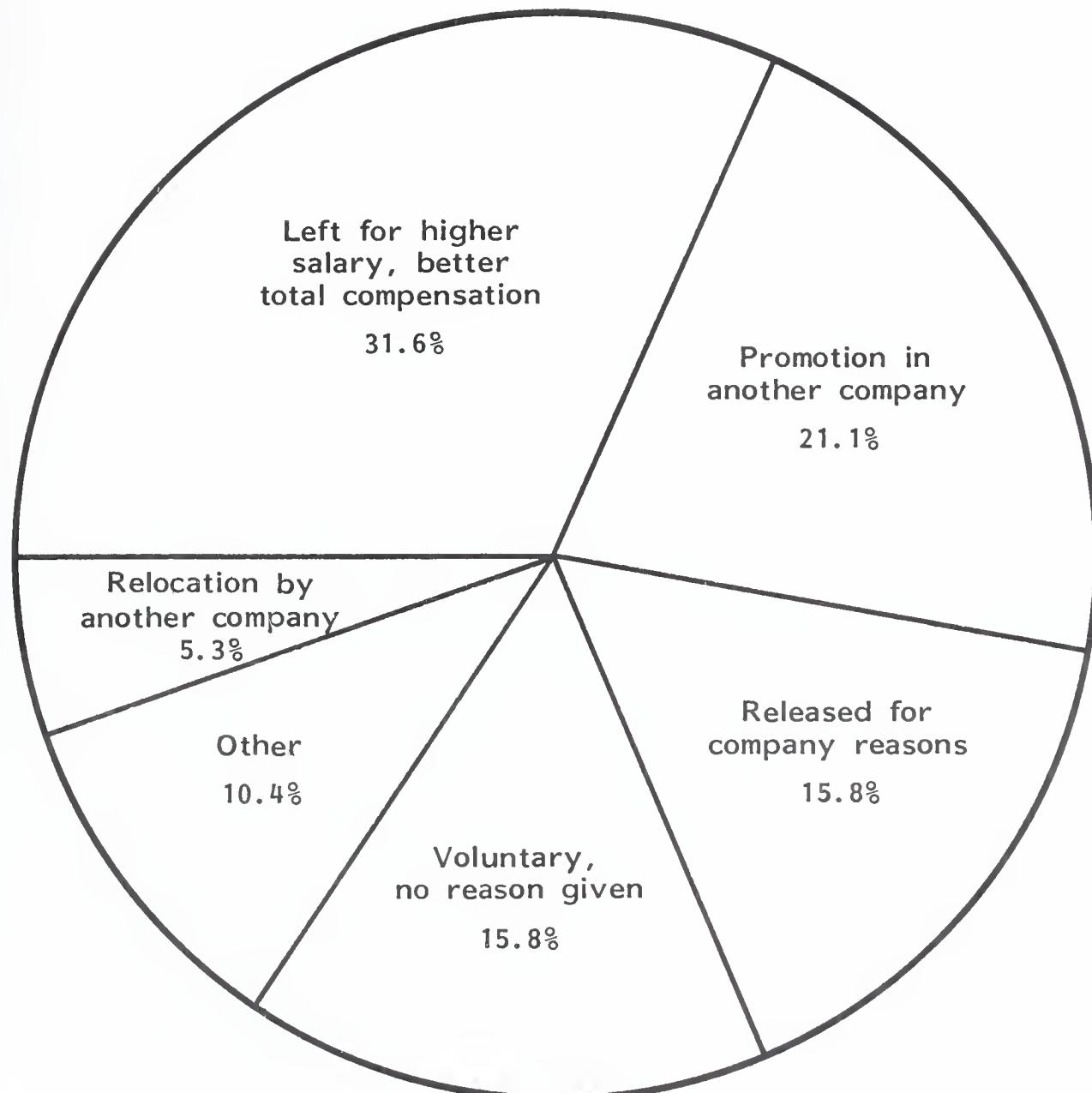
VII RECOMMENDATIONS AND CONCLUSIONS

VII   RECOMMENDATIONS AND CONCLUSIONS

A.   PERSONNEL MANAGEMENT STRATEGIES

- With increased use of modularization, remote diagnostics, user self-diagnosis, and user self-maintenance, plus the impending change to a broader group of after-sales support responsibilities, the role of the field service engineer will change from systems support to that of sole source of client support. The FE's duties have changed from on-site diagnosis and repairs at the system level to remote diagnostics and component and board exchange. These duties will now be widened to include consulting, training, and possibly some limited sales functions.

- Vendors are already showing the effects of this change, namely the broadening range of salaries, especially at the lower ranges, and the increasing staff in the less-skilled positions. These trends should continue in the future, as skill levels of the field engineer change.

- Peripheral/terminal and office product vendors will need to address these trends before determining future staffing and compensation levels. At the same time, vendors will need to keep in mind such factors as the salary requirements and career goals of the employees.

- In order to compete with higher-paying large-system and small-system vendors, peripheral/terminal and office product vendors will need to offer new employees the following:

INPUT

- Benefits at least as attractive as those for large-system companies, especially in the areas of insurance, medical coverage, and personal improvement (counseling services, career path guidelines, etc.).

- Incentives that not only reward the worker for improved performance, but also help the vendor via increased output and improved worker morale.

- Other inducements, such as reimbursed education, training, and company product purchasing, all of which provide the employee with a sense of personal improvement and help build a better company internal image.

- Improvements in this area will not only help vendors recruit new employees, but will also aid in the retention of current employees, the establishment of a more stable workforce, and the reduction of training costs.

- Reducing field service turnover will become an important goal for peripheral/terminal and office product vendors. As more new vendors enter these markets, the demand for qualified field service engineers and managerial talent will rise to a point that necessitates a greater emphasis on recruiting from competitors. This has been true especially for office product vendors.

- Office product vendors will need to be especially wary of the entrance of large-system vendors into the office products market, since large-system vendors' compensation programs will be attractive to office products personnel.

- Training is another aspect of personnel management that is influenced by the changing role of the field engineer. Changes in diagnostics and repair techniques will obviously necessitate changes in training. Peripheral/terminal and office product vendors should continue to emphasize product training at the

- 68 -

technical level and should re-emphasize basic training as more entry-level engineers are brought in.

- Office product vendors will need to increase training in software maintenance as more vendors integrate software and hardware support. This is of critical importance in light of office products users' satisfaction levels as detailed previously in INPUT's report, User Requirements of Office Products.

- Another training area that office product vendors will need to address is the maintenance of competitive products. With the increased use of local-area networks, vendors will need to determine responsibility for service on all products within the network. External training companies can supply vendors with comprehensive training programs on competitive products.

- Peripheral/terminal and office product vendors' management development programs should continue to grow in importance. The rapid growth in the office products industry has forced vendors to look for external sources (namely competitors) for their managerial talent, but as the market develops and matures, vendors should look to internal sources for management.

- An added benefit of management development programs is the incentive it provides to employees, especially upper-level field engineers. By providing more promotion opportunities, management development programs will also reduce turnover.

- Vendors will need to stress interpersonal skills training in order to improve both field service engineer and field service management communications. As users become more involved in both diagnostic and self-maintenance activites, the quantity and, more importantly, quality of interaction between vendor and user will become crucial. Consequently, vendors should place more emphasis on communication skills when developing the field service staff.

INPUT

- By increasing user contact and trust in the vendor, increased communications skills will aid field service involvement in sales support. In this fashion, users will still perceive the field service staff as unbiased sources of assistance, while vendors will have increased opportunities to make recommendations.

B.   CHANGES IN CAREER PATHS

- A final issue affected by the changing role of the field engineer is the altered career paths available to field service personnel. In the past, promotions in field service were dependent to a greater extent on experience and technical expertise. In order to be successful in the diagnosis and repair of large systems, field engineers relied heavily on past experience on those particular systems. Therefore, the most successful engineers were heavily experienced and were used to having sole responsibility for diagnosis and repair.

- With the growing trend toward remote diagnostics, component and board exchange, user self-diagnostics, and user self-maintenance, the successful field engineer requires less systems-level knowledge and has more ability to interact with the user. Thus, promotions will be based not only on technical skill but also on interpersonal skills.

- In addition, field service management will require more communication skills. Users, now responsible for a certain amount of maintenance responsibility, will require assistance from the vendor. Promotion to managerial positions will require these increased communication skills.

- Vendors will need to look for managerial talent that possesses both technical and communication skills. At the start, this talent will be drawn from present employees that demonstrate communication ability. Experienced field engineers with promotable talent yet little interpersonal ability (or, for that matter, little desire to become line managers) can be moved to technical

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support and repair centers, where their technical expertise will be of much benefit to the company. In the next five years as vendors begin to stress the new personnel requirements, future line managers will be abundant within the field service workforce. In this fashion, the field service staff will reflect the "total service concept."

INPUT

APPENDIX A: INCENTIVES ANALYSIS

INCENTIVES OFFERED TO FIELD SERVICE MANAGEMENT EMPLOYEES –
PERIPHERAL/TERMINAL VENDORS

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	73 %	73 %
Performance Bonuses	87	91
Suggestion Awards	40	27
Periodic Recognition Awards	67	73
Special Projects, Foreign Assignments, etc.	40	45
Award Conferences, Trips	53	64
Competitive Scholarships for Employees or Family	27	27

INPUT
FPT3

EXHIBIT A-2

INCENTIVES OFFERED TO FIELD SERVICE EXEMPT EMPLOYEES –
PERIPHERAL/TERMINAL VENDORS

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	40 %	50 %
Performance Bonuses	60	70
Suggestion Awards	53	60
Periodic Recognition Awards	60	80
Special Projects, Foreign Assignments, etc.	40	40
Award Conferences, Trips	47	60
Competitive Scholarships for Employees or Family	30	30

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FPT3

EXHIBIT A-3

INCENTIVES OFFERED TO FIELD SERVICE NONEXEMPT EMPLOYEES –
PERIPHERAL/TERMINAL VENDORS

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	40%	50%
Performance Bonuses	60	70
Suggestion Awards	47	50
Periodic Recognition Awards	60	80
Special Projects, Foreign Assignments, etc.	33	40
Award Conferences, Trips	40	50
Competitive Scholarships for Employees or Family	33	30

INPUT
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EXHIBIT A-4

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INCENTIVES OFFERED TO FIELD SERVICE EXEMPT EMPLOYEES –
OFFICE PRODUCT VENDORS

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	43 %	40 %
Performance Bonuses	43	0
Suggestion Awards	29	60
Periodic Recognition Awards	57	40
Special Projects, Foreign Assignments, etc.	43	20
Award Conferences, Trips	57	60
Competitive Scholarships for Employees or Family	14	20

INPU
FPT3

EXHIBIT A-5

INCENTIVES OFFERED TO FIELD SERVICE NONEXEMPT EMPLOYEES –
OFFICE PRODUCT VENDORS

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	43 %	40 %
Performance Bonuses	14	0
Suggestion Awards	57	60
Periodic Recognition Awards	57	40
Special Projects, Foreign Assignments, etc.	57	40
Award Conferences, Trips	43	20
Competitive Scholarships for Employees or Family	14	20

INPUT
FPT3

INCENTIVES OFFERED TO FIELD SERVICE NONEXEMPT EMPLOYEES —
OFFICE PRODUCT VENDORS

INCENTIVE	PERCENT OF COMPANIES IN 1983	PERCENT OF COMPANIES BY 1985
Stock Options	29%	40%
Performance Bonuses	0	0
Suggestion Awards	57	60
Periodic Recognition Awards	57	40
Special Projects, Foreign Assignments, etc.	57	40
Award Conferences, Trips	43	40
Competitive Scholarships for Employees or Family	14	20

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FPT3

APPENDIX B: VENDOR QUESTIONNAIRE

A. General Management

1. Please check all of the direct services you currently offer or plan to offer in the near future.

DIRECT SERVICE OFFERED	1983	BY 1985	BY 1987
a) Third-party maintenance			
b) Facility maintenance management			
c) Guaranteed availability (uptime)			
d) Guaranteed response time			
e) Guaranteed repair time (hardware)			
f) On-site standby			
g) Variable shift coverage (versus fixed schedules)			
h) On-site spares			
i) Guaranteed turnaround on software repairs			
j) Remote diagnostics			
k) Preventive maintenance and field changes during nonprime hours			
l) System software maintenance			
m) Application software maintenance			
n) Depot maintenance (pickup)			
o) Depot maintenance (carry/mail)			
p) Local area network maintenance			

INPUT

2. Please check the ancillary services your field service organization offers or plans to offer in the near future. Also, for those services you currently provide, please indicate the level of quality you believe that your users would give you. (Scale of 1-10: 10 = excellent, 5 = average, 1 = very poor.)

ANCILLARY SERVICES OFFERED	BY 1985	BY 1987	1983	ON A SCALE OF 1-10, USERS WOULD RATE YOU
a) Environmental planning				
b) Physical site planning (layouts)				
c) Consulting services (hardware)				
d) Consulting services (software)				
e) Customer training				
f) Installation management and coordination				
g) Supplies sales				
h) Add-on sales (additional equipment)				
i) Upgrade sales (new equipment or features)				
j) Site audits				
k) Facility relocation				
l) De-installation				
m) Software sales				
n) Ancillary equipment sales and service				

3. How do you rate your field service organization in the following categories, and how do you believe your users would rate you in the same categories? (Scale 1-10: 10 = excellent, 5 = average, 1 = very poor.)

CATEGORIES RATED: (service over the past 12 months)	RATING (1-10)	
	SELF RATING	EXPECTED USER RATING
a) Management's communication with users		
b) Hardware service engineer's communication		
c) Software service engineer's communication		
d) Ability to diagnose hardware problems and to make quality repairs		
e) Ability to maintain software		
f) General responsiveness of the organization to user requirements		
g) Overall service image		
h) Taking initiative to improve user operations		
i) Resolution of invoicing disputes		
j) Dispatching trouble calls		
k) Escalation procedures during extended outages		

INPUT

4. Please either respond to the following questions or provide us with a functional organization chart (space is provided on the reverse side of this page for your sketch if that is more convenient for you).

FUNCTION	(√) IF NOT FS	TITLE	REPORTS TO (title/function)
a) Top-level field service executive	____	_____	_____
b) Top-level domestic line executive	____	_____	_____
c) Top international line executive	____	_____	_____
d) Field support, general	____	_____	_____
e) Field support, hardware	____	_____	_____
f) Field support, software	____	_____	_____
g) Financial operations	____	_____	_____
h) Administration	____	_____	_____
i) Logistics	____	_____	_____
j) Operations analysis	____	_____	_____
k) Education	____	_____	_____
l) Personnel	____	_____	_____
m) Field service marketing	____	_____	_____
n) Engineering liaison	____	_____	_____
o) OEM liaison	____	_____	_____
p) Legal	____	_____	_____
q) Other_____	____	_____	_____
r) Other_____	____	_____	_____

5. Lower level management and employees are encouraged by some companies to participate in the following activities. Please check those that apply now and in the near future for your company. (Enc. = Encouraged, Mand. = Mandatory.)

ACTIVITIES	1983		1985		1987	
	ENC.	MAND.	ENC.	MAND.	ENC.	MAND.
a) Making good-will calls on users	____	____	____	____	____	____
b) Selling maintenance contracts	____	____	____	____	____	____
c) Accompanying sales personnel on sales calls	____	____	____	____	____	____
d) Attending sales meetings	____	____	____	____	____	____
e) Furthering formal education	____	____	____	____	____	____
f) Making public appearances	____	____	____	____	____	____
g) Joining organizations such as AFSM, Jaycees, etc.	____	____	____	____	____	____
h) Reading trade journals	____	____	____	____	____	____
i) Other _____	____	____	____	____	____	____
j) Other _____	____	____	____	____	____	____
k) Other _____	____	____	____	____	____	____

INPUT

B. Field Support/Product Support

1. Please rate the trends of the influence of your field service management in the following company activities relative to small systems. (Scale of 1-10:   10 = excellent, 5 = average, 1 = very poor.)

ACTIVITIES	RATING (1-10)		
	1982	1983	EXPECTED 1984
a) Product specification			
b) Product design			
c) Serviceability design			
d) Documentation			
e) Diagnostic development			
f) Selection of test equipment			
g) Spares requirements			
h) Geographic control of sales			
i) Exceptions to standard maintenance agreements			
j) Product performance objectives			
k) Quality control in manufacturing			
l) OEM acceptance criteria			
m) Customer education			

INPUT

2. Please indicate the level that small system software support has been or will be integrated into the hardware support structure. (0% = no field service responsibility, 100% = fully integrated responsibility.)

SOFTWARE SUPPORT ACTIVITY	PERCENT INTEGRATED			
	1982	1983	1985	1987
a) System control programs at headquarters support level	____%	____%	____%	____%
b) System control programs in the field	____	____	____	____
c) Compilers and system utilities at headquarters	____	____	____	____
d) Compilers and system utilities in the field	____	____	____	____
e) Applications software developed, sold, or distributed by your company - headquarters support	____	____	____	____
f) Applications (as in "e" above) in the field	____	____	____	____
g) Maintenance of third-party software, including user's, at headquarters level	____	____	____	____
h) Maintenance of third-party software in the field	____	____	____	____

3. Please describe your field support or support center structure as it relates to:

a) User support requirements when users are involved via remote diagnostics.

_____
_____
_____
_____
_____
_____

b) User support requirements when users are assisted through preliminary stages of problem determination.

_____
_____
_____
_____
_____
_____

INPUT

3. (Continued)

    c) Support of on-site field personnel via telephone and/or remote diagnostics.

       _____

       _____

       _____

       _____

       _____

    d) Physical, on-site support to field personnel (please discuss criteria):

       _____

       _____

       _____

       _____

       _____

4. Please provide the objectives and actuals in product performance for the most active small systems serviced by your organization.

MODEL NUMBER OR NAME OF MAINFRAMES	MEAN TIME TO REPAIR (hours)		MEAN TIME BETWEEN FAILURES (hours)		AVERAGE AVAILABILITY (percent)		MEAN TIME TO RESPOND (hours)	
	OBJ.	ACT.	OBJ.	ACT.	OBJ.	ACT.	OBJ.	ACT.
a) _____								
b) _____								
c) _____								
d) _____								
e) _____								

INPUT

5. Please check the following items that apply in your field support organization (even if applicable to only one product currently serviced in the field). If not presently implemented, please indicate year scheduled.

	CURRENTLY IMPLEMENTED? YES/NO	YEAR SCHEDULED
a) Remote diagnostics	_____	_____
b) Centralized dispatching	_____	_____
c) Modular, plug-in units for user to deliver to repair centers	_____	_____
d) Real-time incident reporting	_____	_____
e) Real-time IR (parts usage included)	_____	_____
f) Signature analysis (field)	_____	_____
g) Regional repair centers	_____	_____
h) Third-party repair centers	_____	_____
i) Third-party on-site maintenance	_____	_____
j) User support centers	_____	_____

6. a) What has been the trend in your capital investment in small system spare parts inventories for the years indicated below? Please respond by percentage of gross service revenues derived from support of small systems.

YEAR OF MEASUREMENT	PERCENT OF GROSS SERVICE REVENUES FOR YEAR
1981	_____ %
1982	_____ %
1983 (most recent inventory)	_____ %
1984 (projected)	_____ %
1985 (projected)	_____ %

b) To what most significant factors do you contribute the changes, i.e., growth of installed base, regional spares depots, regional repair centers, reliability of new products, etc.?

Comment:_____

_____

_____

_____

_____

INPUT

7. a) Have you announced or have you set a policy on the maintenance and support of local area networks serving competitive products? Yes/No_____

   b) If yes, please comment on your position.

   _____

   _____

   _____

   _____

   _____

   _____

   c) If no, do you have any general comment on the subject of local area networks without making a policy statement?

   _____

   _____

   _____

   _____

   _____

   _____

   _____

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C. Financial/Administrative Operations

1. How do you measure changes in field service productivity when measuring the effectiveness of changes in operating methods or investment in capital improvements?

MEASUREMENT METHOD:	YES/NO
a) Ratio of gross revenue carried per field service person per month	_____
b) Ratio of personnel to equipment by category of equipment	_____
c) Ratio of personnel to management	_____
d) Net ratio of expenses to revenue after cost of improvement	_____
e) Other_____	_____
_____	_____
_____	_____

2. What levels of productivity have you realized in servicing small systems for the following? (Please classify measurement using a-e in question 1 above.)

IMPROVEMENT	MEASUREMENT METHOD (a-e)	PRODUCTIVITY IMPROVEMENT (percent)
a) Remote diagnostics	_____	_____
b) Repair centers	_____	_____
c) Regional parts depots	_____	_____
d) Centralized dispatch	_____	_____
e) Support centers	_____	_____
f) Field education	_____	_____
g) Cross training	_____	_____
h) Multiple territory assignments	_____	_____
i) Other_____	_____	_____
_____	_____	_____
_____	_____	_____

INPUT

3. Please indicate the percentage of total operating revenues credited to the field service division coming from the following categories. (If fiscal is different from calendar, please supply FY dates.)

SOURCE OF REVENUE CREDITS	PERCENT OF TOTAL REVENUE		
	1982	1983	1984
a) Equipment warranty credits	_____ %	_____ %	_____ %
b) Basic period contracts for maintenance			
c) Extra shift premium			
d) Time and material (labor)			
e) Time and material (parts)			
f) Third-party contracts			
g) Installation charges			
h) De-installation charges			
i) Technical consulting			
j) Management consulting			
k) Parts repairs			
l) Parts sales			
m) Supplies sales			
n) Sales of ancillary equipment			
o) Maintenance of ancillary equipment			
p) Sales of software products			
q) Maintenance of software products			
r) Revenues from other divisions			
s) Other _____			
t) Other _____			
u) Other _____			

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4. Please indicate the percentage of total field service division expenses in the following categories (and supply FY dates if different from calendar year).

EXPENSE LINE ITEM	PERCENT OF TOTAL EXPENSES [use ( ) to indicate credit]		
	1982	1983	1984
a) Basic direct labor, wages, salaries	_____	_____	_____
b) Direct labor overtime shift premiums and standby pay	_____	_____	_____
c) Support personnel salaries	_____	_____	_____
d) Management and administrative salaries and premiums	_____	_____	_____
e) Benefits programs	_____	_____	_____
f) Net parts usage	_____	_____	_____
g) Inventory variances	_____	_____	_____
h) Depreciation	_____	_____	_____
i) Travel (includes auto leases)	_____	_____	_____
j) Relocation	_____	_____	_____
k) Education	_____	_____	_____
l) Equipment rental/lease	_____	_____	_____
m) Office, warehouse space	_____	_____	_____
n) Communications	_____	_____	_____
o) Interdivisional transfers	_____	_____	_____
p) Logistics, repair depot, and other expenses not reported above	_____	_____	_____
q) Corporate general and administrative allocation (overhead)	_____	_____	_____
r) Other significant categories			
_____	_____	_____	_____
_____	_____	_____	_____

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INPUT

5. Please check any of the following interdivisional transfers of revenues and expenses between your field service division and other departments, and indicate whether they are treated as revenue or expense items by checking the appropriate columns. (Check all columns that apply.)

INTERDIVISIONAL TRANSFERS OF ITEMS	REVENUE (FE)		EXPENSE (FE)	
	CREDIT (✓)	DEBIT (✓)	CREDIT (✓)	DEBIT (✓)
a) Warranty of equipment	____	____	____	____
b) Spare parts used during warranty	____	____	____	____
c) Direct labor during warranty	____	____	____	____
d) Sales assistance	____	____	____	____
e) Maintenance sales commissions	____	____	____	____
f) Manufacturing assistance	____	____	____	____
g) Engineering assistance	____	____	____	____
h) Extended warranties	____	____	____	____
i) Nonstandard contract terms, e.g., on-site engineers	____	____	____	____
j) Defective spare parts	____	____	____	____
k) Sales changes to equipment	____	____	____	____
l) Saftey changes	____	____	____	____
m) Engineering changes	____	____	____	____
n) Other _____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____

6. Please supply the figures as indicated for your overall financial performance (indicate fiscal year if different from calendar year).

FINANCIAL PERFORMANCE	FISCAL YEAR END _____			
	1982	1983	1984	1987
a) Field service revenue ($ millions)	____	____	____	____
b) Field service expenses ($ millions)	____	____	____	____
c) Pretax profit (percent)	____	____	____	____
d) Revenue per field service engineer (direct labor)	____	____	____	____
e) Direct expense per field service engineer (direct labor)	____	____	____	____
f) Fully burdened expense per field service engineer (direct labor)	____	____	____	____
g) Basic hourly rate charged for service	____	____	____	____
h) Fully burdened field service expense per field service employee (all categories)	____ ____			

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7. Please comment below on service to remote customers: zone charges, response times, etc.

   a) Zone definitions:

       Primary zone   _0_ – _____ miles

       Zone 2   _____ – _____ miles

       Zone 3   _____ – _____ miles

       Other criteria: _____

       _____

       _____

       _____

   b) Zone premiums added to basic maintenance charges: _____

       _____

       _____

       _____

       _____

   c) Response time targets for zones: _____

       _____

       _____

       _____

       _____

       _____

   d) Other comments: _____

       _____

       _____

       _____

       _____

       _____

       _____

INPUT

8. a) Please describe the methodology your company uses to set small system maintenance prices (percent of purchase tested against cost of service projection, etc.):

_____

_____

_____

_____

_____

b) At what ratio of basic maintenance price to list price do you believe that:

i) Small system users will actively consider alternative sources	_____ %
ii) Small system users will definitely contract third party or maintain own equipment	_____ %
iii) Users will refuse to buy the original product, given the option	_____ %

c) How frequently have you and do you expect to change prices of maintenance for:

	FREQUENCY OF CHANGE (months)			
	1982	1983	1984	1985
i) Small systems	_____	_____	_____	_____
ii) Basic hourly rates	_____	_____	_____	_____
iii) Shift differential	_____	_____	_____	_____

d) Do you offer discounts for:

	PERCENT DISCOUNT
i) User assistance in remote diagnostics	_____ %
ii) User replacement of plug-in modules or units	_____ %
iii) User delivery of plug-in modules or units to repair center	_____ %
iv) Relaxed requirement on response time	_____ %
v) User purchase of spare parts kits	_____ %
vi) Other: _____	_____ %

INPUT

9. Contract administration:

   a) Are your maintenance contracts: (i) automatically renewed_____ or (ii) negotiated each renewal cycle?_____

   b) What is the length of your normal contract?_____ (months)

   c) Do you normally invoice (i) monthly_____ , (ii) quarterly_____ , (iii) semiannually_____ , (iv) annually_____ ,
      (v) other_____ .

   d) Do you invoice for exceptions (time and material, etc.) at a different time than your normal cycle?
      Yes/No_____ If yes, please describe:

      _____

      _____

      _____

      _____

   e) Who is responsible for maintenance contract:

      i)   Negotiation_____

      ii)   Renewal_____

      iii) Administration_____

10. a) Has your field service division implemented a field quality assurance program or other formal operational
       audit? Yes/No _____

    b) If yes, please describe: _____

       _____

       _____

       _____

       _____

       _____

       _____

       _____

INPUT

11. What is the average cost breakdown of a typical fault call? (Please respond for products your company services.)

PRODUCT SERVICED	TOTAL COST (dollars)	DIRECT LABOR (percent)	TRAVEL (percent)	PARTS (percent)	OVERHEAD & SUPPORT
Large mainframes					
Medium mainframes					
Small systems					
Peripherals					
Terminals					
Word processors					
Personal computers					
Copiers, facsimile					
Work stations					
PABX, PBX					
Teleprocessing/communications					

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D. Personnel

1. Please identify your sources of new employees and rate them on a scale of 1-10. (1 = little or no importance, 10 = highest importance.)

SOURCE OF NEW EMPLOYEES	RATING (1-10)			
	1982	1983	1984	1987
a) Competition				
b) Trade schools				
c) Military schools				
d) Two-year college programs				
e) Four-year colleges				
f) Apprenticeship programs				
g) Other division in company				
h) Employee referrals				
i) Headquarters				
j) Other: _____				

2. Do you provide in-company formal training for:

	YES/NO
a) Indoctrination	
b) Basic training (apprentice level)	
c) Product (technical)	
d) Systems software (system)	
e) Applications software	
f) Management development	
g) Technological upgrading	

INPUT

3. Do you fully (F) or partially (P) reimburse or otherwise provide financial support for:

	F/P
a) University courses	_____
b) Out-company seminars in management development	_____
c) Professional association membership	_____
d) Purchase of company stock	_____
e) Professional trade journals	_____
f) Matching grants to educational institutions	_____
g) Children's higher education	_____
h) Out-company training in professional (technical) development	_____
i) Nonexempt employee relocation	_____
j) New-hire relocation	_____
k) Exempt employee relocation	_____
l) Lease or purchase of automobiles to be used for business	_____
m) Lease or purchase of company products (micros, minis, personal computers, typewriters, etc.)	_____
n) Other: _____	_____
_____	_____
_____	_____

INPUT

4. Do your personnel policies and procedures provide for the following employee benefits and assurances? (Y/N)

	EXEMPT		NONEXEMPT	
FRINGE BENEFITS	1983	BY 1985	1983	BY 1985
a) Life insurance				
b) Hospitalization				
c) Major medical (80% or better)				
d) Limited medical (out patient)				
e) Dental				
f) Eyesight/glasses				
g) Retirement				
h) Disability insurance				
i) Matched savings				
j) Profit-sharing				
k) Paid sick leave				
l) Grievance procedures				
m) Improvement programs for marginal performers				
n) Exit interviews				
o) Appraisal and counseling				
p) Career path definitions				
q) Pay for performance guidelines				

5. Does your company provide incentives for field service employees? (Indicate by check mark.)

	MANAGEMENT		EXEMPT		NONEXEMPT	
INCENTIVES	1983	BY 1985	1983	BY 1985	1983	BY 1985
a) Stock options						
b) Performance bonuses						
c) Suggestion awards						
d) Periodic recognition awards ("FE of the quarter," etc.)						
e) Special projects, foreign assignments, etc.						
f) Award conferences, trips						
g) Competitive scholarships for employees or family						
h) Other:_____						
_____						

INPUT

6. a) How many direct labor field service personnel were hired in the following years?

1982 _____

1983 _____ (forecast)

1984 _____ (forecast)

b) How many direct-labor field service personnel left your company in:

1982 _____

1983 _____ (forecast)

c) What percentage of the persons leaving leave for the following reasons:

		1982	1983
i)	Voluntary, no reason given	_____ %	_____ %
ii)	Left for higher salary, better total compensation	_____	_____
iii)	Released for company reasons	_____	_____
iv)	Promotion in another company	_____	_____
v)	Relocation by another company	_____	_____
vi)	Promoted within own company	_____	_____
vii)	Transferred to foreign subsidiary or other division	_____	_____
viii)	Other _____	_____	_____
	Total	100%	100%

d) Staffing levels:

U.S. EMPLOYEES	1983	1984
i) Total employees in company	_____	_____
ii) Total in field service division	_____	_____
iii) Number of direct-labor FEs	_____	_____
iv) Number of field support engineers	_____	_____
v) Number of field supervisors	_____	_____
vi) Number of managers in field	_____	_____
vii) Line managers at headquarters	_____	_____
viii) FE staff managers (total)	_____	_____
ix) FE staff personnel (nonmanagement including administration)	_____	_____

INPUT

7. 1983 annual salaries, small system field engineers (front-line product field service technicians)

JOB DESCRIPTION	TITLE	(✓) EXEMPT	NUMBER IN U.S.	RANGE MAXIMUM	RANGE MINIMUM	AVERAGE PAID (actual)	AVERAGE GAIN OVER 1982 (percent)
a) Entry-level trainee for hardware maintenance		( )					%
b) Entry-level trainee in software maintenance		( )					%
c) Minimum experience level qualified to respond to trouble calls, generally requires assistance		( )					%
d) Qualified field service technician carries territory, requires occasional assistance, renders some aid to lower levels		( )					%
e) Senior-level field service technician: generally gives more assistance than received, assigned field training duties to assist in development of first two categories (above)		( )					%
f) Qualified field service engineer in software support		( )					%
g) Senior level software support in field		( )					%
h) Top-level hardware specialist located in field office		( )					%
i) Top-level software specialist located in field office		( )					%

INPUT

8. 1983 annual salaries, field office staff personnel

JOB DESCRIPTION	TITLE	(✓) EXEMPT	NUMBER IN U.S.	RANGE		AVERAGE PAID (actual)	AVERAGE GAIN OVER 1982 (percent)
				MINIMUM	MAXIMUM		
a) Repair depot, repair technician trainee		( )					%
b) Repair depot, repair technician		( )					%
c) Senior-level repair depot technician		( )					%
d) Office administrator, Jr.		( )					%
e) Office administrator, Sr.		( )					%
f) Field service supervisor may work approximately 50/50 on equipment and management		( )					%
g) First-line manager of field service engineers		( )					%
h) Second-line manager located in field offices		( )					%
i) Staff manager in education and field support		( )					%
j) Staff manager in operations and financial analysis		( )					%
k) Field service administration manager		( )					%
l) Field service personnel manager		( )					%

INPUT